



Full wwPDB EM Validation Report ⓘ

Mar 8, 2026 – 02:33 PM UTC

PDB ID : 7L8U / pdb_00007l8u
EMDB ID : EMD-23237
Title : BG505 SOSIP.v5.2 N241/N289 in complex with the polyclonal Fab pAbC-2 from animal Rh.33311 (Wk26 time point)
Authors : Antanasijevic, A.; Sewall, L.M.; Rantalainen, K.; Ward, A.B.
Deposited on : 2021-01-01
Resolution : 4.50 Å (reported)
Based on initial models : 6VL5, 4KTE

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

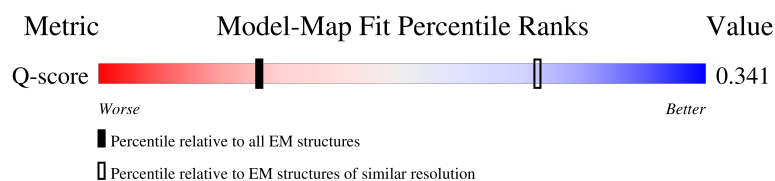
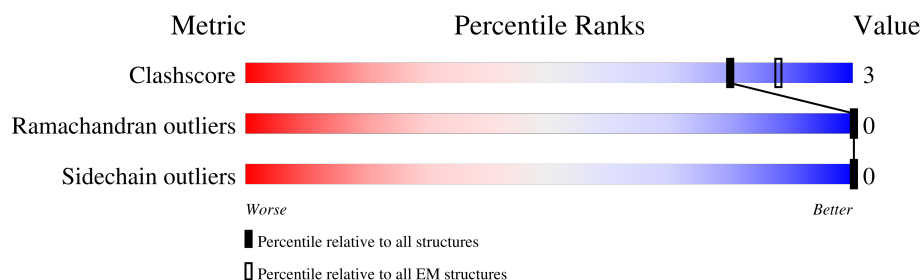
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

1 Overall quality at a glance

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 4.50 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	2937 (4.00 - 5.00)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	503	 6% 77% 10% 13%
1	C	503	 6% 78% 7% 15%
1	E	503	 6% 79% 6% 14%
2	B	145	 8% 80% 7% 13%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
2	D	145	
2	F	145	
3	H	113	
4	L	105	
5	G	2	
5	I	2	
5	J	2	
5	K	2	
5	N	2	
5	O	2	
5	Q	2	
5	R	2	
5	T	2	
6	M	5	
7	P	7	
8	S	5	

2 Entry composition

There are 9 unique types of molecules in this entry. The entry contains 15475 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called BG505 SOSIP.v5.2 N241/N289 - gp120.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	C	430	Total	C	N	O	S	0	0
			3401	2142	598	633	28		
1	A	438	Total	C	N	O	S	0	0
			3459	2173	613	645	28		
1	E	431	Total	C	N	O	S	0	0
			3410	2147	602	633	28		

- Molecule 2 is a protein called BG505 SOSIP.v5.2 N241/N289 - gp41.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	D	132	Total	C	N	O	S	0	0
			1052	662	183	200	7		
2	B	126	Total	C	N	O	S	0	0
			1006	634	177	188	7		
2	F	118	Total	C	N	O	S	0	0
			942	593	164	179	6		

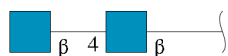
- Molecule 3 is a protein called Rh.33311 pAbC-2 - Heavy Chain.

Mol	Chain	Residues	Atoms				AltConf	Trace
3	H	113	Total	C	N	O	0	0
			565	339	113	113		

- Molecule 4 is a protein called Rh.33311 pAbC-2 - Light Chain.

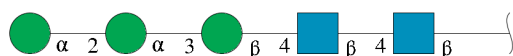
Mol	Chain	Residues	Atoms				AltConf	Trace
4	L	105	Total	C	N	O	0	0
			525	315	105	105		

- Molecule 5 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



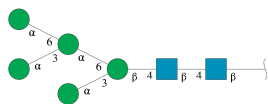
Mol	Chain	Residues	Atoms				AltConf	Trace
5	G	2	Total	C	N	O	0	0
			28	16	2	10		
5	I	2	Total	C	N	O	0	0
			28	16	2	10		
5	J	2	Total	C	N	O	0	0
			28	16	2	10		
5	K	2	Total	C	N	O	0	0
			28	16	2	10		
5	N	2	Total	C	N	O	0	0
			28	16	2	10		
5	O	2	Total	C	N	O	0	0
			28	16	2	10		
5	Q	2	Total	C	N	O	0	0
			28	16	2	10		
5	R	2	Total	C	N	O	0	0
			28	16	2	10		
5	T	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 6 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



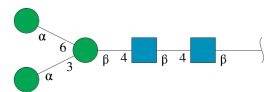
Mol	Chain	Residues	Atoms				AltConf	Trace
6	M	5	Total	C	N	O	0	0
			61	34	2	25		

- Molecule 7 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



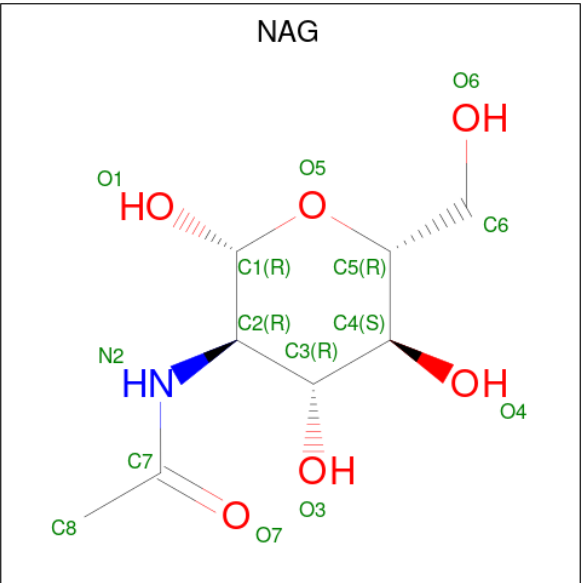
Mol	Chain	Residues	Atoms				AltConf	Trace
7	P	7	Total	C	N	O	0	0
			83	46	2	35		

- Molecule 8 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
8	S	5	Total	C	N	O	0	0
			61	34	2	25		

- Molecule 9 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C₈H₁₅NO₆).



Mol	Chain	Residues	Atoms				AltConf
9	C	1	Total	C	N	O	0
			14	8	1	5	
9	C	1	Total	C	N	O	0
			14	8	1	5	

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms				AltConf
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	C	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0

Continued on next page...

Continued from previous page...

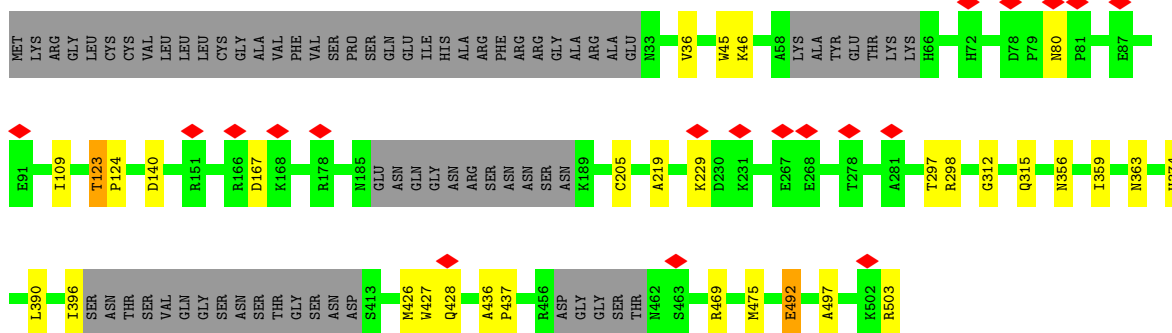
Mol	Chain	Residues	Atoms				AltConf
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	A	1	Total 14	C 8	N 1	O 5	0
9	B	1	Total 14	C 8	N 1	O 5	0
9	B	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0
9	E	1	Total 14	C 8	N 1	O 5	0

Continued on next page...

Continued from previous page...

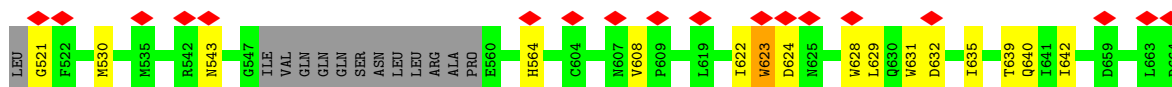
Mol	Chain	Residues	Atoms				AltConf
9	F	1	Total	C	N	O	0
			14	8	1	5	
9	F	1	Total	C	N	O	0
			14	8	1	5	
9	F	1	Total	C	N	O	0
			14	8	1	5	

Chain E: 



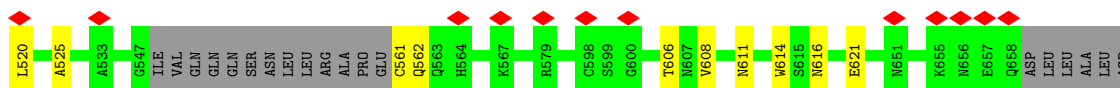
- Molecule 2: BG505 SOSIP.v5.2 N241/N289 - gp41

Chain D: 



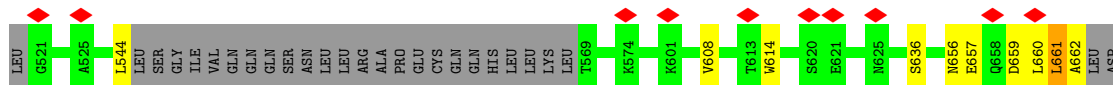
- Molecule 2: BG505 SOSIP.v5.2 N241/N289 - gp41

Chain B: 

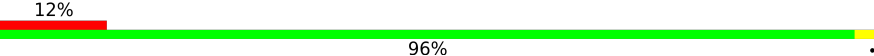


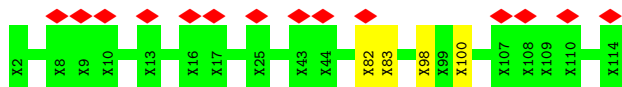
- Molecule 2: BG505 SOSIP.v5.2 N241/N289 - gp41

Chain F: 

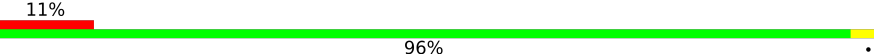


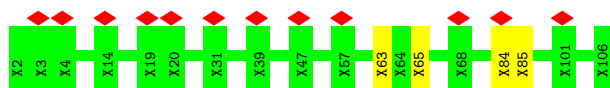
- Molecule 3: Rh.33311 pAbC-2 - Heavy Chain

Chain H: 



- Molecule 4: Rh.33311 pAbC-2 - Light Chain

Chain L: 



- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain G:  100%

 NAG1
NAG2

- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain I:  50% 50%

 NAG1
NAG2

- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain J:  50% 50%

 NAG1
NAG2

- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain K:  100%

 NAG1
NAG2

- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain N:  50% 100%

 NAG1
NAG2

- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain O:  50% 50% 50%

 NAG1
NAG2

- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



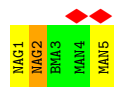
- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



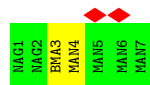
- Molecule 5: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 6: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 7: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 8: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



MAG1	MAG2	BMA3	MAN4	MAN5
------	------	------	------	------

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	28188	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	44.3	Depositor
Minimum defocus (nm)	600	Depositor
Maximum defocus (nm)	1600	Depositor
Magnification	29000	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.057	Depositor
Minimum map value	-0.035	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.002	Depositor
Recommended contour level	0.018	Depositor
Map size (Å)	370.8, 370.8, 370.8	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.03, 1.03, 1.03	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: MAN, NAG, BMA

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	1.11	2/3530 (0.1%)	1.28	37/4792 (0.8%)
1	C	1.11	3/3471 (0.1%)	1.30	31/4713 (0.7%)
1	E	1.08	4/3480 (0.1%)	1.30	33/4724 (0.7%)
2	B	1.14	0/1024	1.12	3/1387 (0.2%)
2	D	1.05	0/1070	1.18	8/1450 (0.6%)
2	F	1.11	1/959 (0.1%)	1.17	6/1301 (0.5%)
All	All	1.10	10/13534 (0.1%)	1.27	118/18367 (0.6%)

All (10) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	E	503	ARG	NE-CZ	7.06	1.40	1.33
1	A	30	ARG	NE-CZ	6.81	1.40	1.33
1	C	396	ILE	CB-CG1	6.71	1.66	1.53
2	F	544	LEU	CB-CG	6.31	1.66	1.53
1	E	396	ILE	CB-CG1	6.29	1.66	1.53
1	A	39	TYR	CB-CG	-5.56	1.39	1.51
1	E	374	HIS	CB-CG	-5.29	1.42	1.50
1	C	469	ARG	CD-NE	-5.27	1.38	1.46
1	C	34	LEU	CB-CG	5.15	1.63	1.53
1	E	374	HIS	CG-CD2	-5.14	1.30	1.35

All (118) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	80	ASN	CA-C-N	7.74	127.75	119.78
1	A	80	ASN	C-N-CA	7.74	127.75	119.78
1	A	298	ARG	CA-C-N	7.67	127.30	119.56
1	A	298	ARG	C-N-CA	7.67	127.30	119.56
1	E	437	PRO	N-CA-C	-7.46	103.31	110.47

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	525	ALA	N-CA-C	-7.31	103.79	114.39
1	E	205	CYS	CA-C-N	7.05	126.75	119.56
1	E	205	CYS	C-N-CA	7.05	126.75	119.56
1	E	80	ASN	CA-C-N	7.01	127.05	119.90
1	E	80	ASN	C-N-CA	7.01	127.05	119.90
1	A	492	GLU	CA-C-N	6.96	127.11	119.87
1	A	492	GLU	C-N-CA	6.96	127.11	119.87
1	E	298	ARG	CA-C-N	6.95	127.10	119.87
1	E	298	ARG	C-N-CA	6.95	127.10	119.87
1	C	205	CYS	CA-C-N	6.90	127.05	119.87
1	C	205	CYS	C-N-CA	6.90	127.05	119.87
1	C	492	GLU	CA-C-N	6.84	126.98	119.87
1	C	492	GLU	C-N-CA	6.84	126.98	119.87
1	E	219	ALA	CA-C-N	6.83	126.79	120.03
1	E	219	ALA	C-N-CA	6.83	126.79	120.03
2	F	608	VAL	CA-C-N	6.83	127.00	120.31
2	F	608	VAL	C-N-CA	6.83	127.00	120.31
1	C	219	ALA	CA-C-N	6.77	126.73	120.03
1	C	219	ALA	C-N-CA	6.77	126.73	120.03
1	A	205	CYS	CA-C-N	6.70	126.40	119.56
1	A	205	CYS	C-N-CA	6.70	126.40	119.56
2	F	661	LEU	N-CA-C	-6.67	104.00	111.28
1	C	211	GLU	CA-C-N	6.67	126.63	119.76
1	C	211	GLU	C-N-CA	6.67	126.63	119.76
2	B	608	VAL	CA-C-N	6.47	126.43	120.03
2	B	608	VAL	C-N-CA	6.47	126.43	120.03
1	E	492	GLU	CA-C-N	6.35	126.48	119.87
1	E	492	GLU	C-N-CA	6.35	126.48	119.87
1	C	382	PHE	N-CA-C	6.34	118.85	108.52
1	C	194	ILE	N-CA-C	6.25	117.00	110.62
1	E	497	ALA	CA-C-N	6.17	126.14	120.03
1	E	497	ALA	C-N-CA	6.17	126.14	120.03
1	A	219	ALA	CA-C-N	6.17	126.36	120.31
1	A	219	ALA	C-N-CA	6.17	126.36	120.31
1	A	267	GLU	N-CA-C	6.11	117.94	111.28
1	C	298	ARG	CA-C-N	6.09	125.79	119.64
1	C	298	ARG	C-N-CA	6.09	125.79	119.64
1	A	235	GLY	N-CA-C	-6.05	107.06	114.92
1	A	486	TYR	N-CA-C	5.97	119.44	109.95
1	C	417	PRO	N-CA-C	-5.89	102.01	111.38
1	C	437	PRO	CA-C-N	5.89	125.80	119.85
1	C	437	PRO	C-N-CA	5.89	125.80	119.85

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	365	SER	N-CA-C	-5.84	101.76	110.23
1	A	100	MET	N-CA-C	-5.84	105.05	111.82
2	D	521	GLY	CA-C-N	5.82	128.39	120.54
2	D	521	GLY	C-N-CA	5.82	128.39	120.54
1	E	436	ALA	CA-C-N	5.81	123.90	119.66
1	E	436	ALA	C-N-CA	5.81	123.90	119.66
1	A	123	THR	CA-C-N	5.78	125.49	119.82
1	A	123	THR	C-N-CA	5.78	125.49	119.82
1	C	437	PRO	N-CA-C	-5.74	103.70	110.70
1	A	497	ALA	CA-C-N	5.73	126.60	120.13
1	A	497	ALA	C-N-CA	5.73	126.60	120.13
1	A	437	PRO	CA-C-N	5.67	125.64	120.03
1	A	437	PRO	C-N-CA	5.67	125.64	120.03
1	C	497	ALA	CA-C-N	5.66	125.57	119.85
1	C	497	ALA	C-N-CA	5.66	125.57	119.85
1	C	312	GLY	CA-C-N	5.63	126.88	119.84
1	C	312	GLY	C-N-CA	5.63	126.88	119.84
2	F	636	SER	CA-C-N	5.62	128.38	120.28
2	F	636	SER	C-N-CA	5.62	128.38	120.28
1	C	123	THR	CA-C-N	5.61	125.29	119.56
1	C	123	THR	C-N-CA	5.61	125.29	119.56
2	D	623	TRP	CB-CA-C	-5.55	99.38	110.42
1	A	345	VAL	N-CA-C	-5.55	105.44	110.82
2	D	608	VAL	CA-C-N	5.47	125.37	119.85
2	D	608	VAL	C-N-CA	5.47	125.37	119.85
1	E	315	GLN	N-CA-C	5.44	116.25	108.74
1	C	199	SER	N-CA-C	5.44	117.11	108.79
1	A	459	GLY	N-CA-C	-5.42	107.53	114.85
1	E	36	VAL	N-CA-C	5.40	116.06	109.30
2	F	614	TRP	N-CA-C	-5.39	104.28	112.04
1	A	488	VAL	N-CA-C	5.34	115.58	108.11
1	E	437	PRO	CA-C-N	5.33	125.23	119.85
1	E	437	PRO	C-N-CA	5.33	125.23	119.85
1	E	390	LEU	N-CA-C	-5.31	106.65	113.23
1	E	297	THR	N-CA-C	5.28	117.28	108.99
1	E	167	ASP	CA-CB-CG	5.28	117.88	112.60
1	E	363	ASN	CA-CB-CG	5.27	117.87	112.60
1	C	78	ASP	CA-C-N	5.27	124.93	119.56
1	C	78	ASP	C-N-CA	5.27	124.93	119.56
1	A	393	SER	N-CA-C	5.26	117.07	108.76
1	A	413	SER	CA-C-N	5.23	128.88	121.66
1	A	413	SER	C-N-CA	5.23	128.88	121.66

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	339	ASN	CA-C-N	5.22	131.51	121.54
1	A	339	ASN	C-N-CA	5.22	131.51	121.54
1	A	261	LEU	CA-C-N	5.20	129.51	122.07
1	A	261	LEU	C-N-CA	5.20	129.51	122.07
1	E	312	GLY	CA-C-N	5.18	126.31	119.84
1	E	312	GLY	C-N-CA	5.18	126.31	119.84
1	E	123	THR	CA-C-N	5.14	124.86	119.82
1	E	123	THR	C-N-CA	5.14	124.86	119.82
2	D	622	ILE	CA-C-N	-5.12	111.77	121.54
2	D	622	ILE	C-N-CA	-5.12	111.77	121.54
1	C	249	HIS	N-CA-C	-5.11	102.72	110.28
1	A	199	SER	N-CA-C	5.11	116.61	108.79
1	C	72	HIS	CA-CB-CG	-5.10	108.70	113.80
2	D	543	ASN	CA-CB-CG	5.08	117.68	112.60
1	C	485	LYS	N-CA-C	5.05	118.98	112.41
1	A	78	ASP	CA-C-N	5.05	124.67	119.56
1	A	78	ASP	C-N-CA	5.05	124.67	119.56
1	A	312	GLY	CA-C-N	5.04	126.14	119.84
1	A	312	GLY	C-N-CA	5.04	126.14	119.84
1	C	80	ASN	CA-C-N	5.04	124.95	119.76
1	C	80	ASN	C-N-CA	5.04	124.95	119.76
1	E	45	TRP	N-CA-C	5.04	115.96	108.60
1	E	229	LYS	N-CA-C	-5.02	106.40	112.88
1	A	99	ASN	CA-CB-CG	-5.02	107.58	112.60
1	E	359	ILE	N-CA-C	5.02	115.08	107.80
1	C	339	ASN	CA-CB-CG	5.01	117.61	112.60
1	E	140	ASP	N-CA-C	5.01	117.47	111.71
1	E	469	ARG	CA-C-N	5.00	124.91	119.76
1	E	469	ARG	C-N-CA	5.00	124.91	119.76

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3459	0	3397	24	0
1	C	3401	0	3341	22	0
1	E	3410	0	3357	9	0
2	B	1006	0	985	8	0
2	D	1052	0	1030	21	0
2	F	942	0	915	3	0
3	H	565	0	143	3	0
4	L	525	0	125	2	0
5	G	28	0	25	0	0
5	I	28	0	25	1	0
5	J	28	0	25	1	0
5	K	28	0	25	0	0
5	N	28	0	25	0	0
5	O	28	0	25	0	0
5	Q	28	0	25	0	0
5	R	28	0	25	0	0
5	T	28	0	25	0	0
6	M	61	0	52	1	0
7	P	83	0	70	0	0
8	S	61	0	52	0	0
9	A	210	0	195	0	0
9	B	28	0	26	3	0
9	C	210	0	195	0	0
9	E	168	0	156	0	0
9	F	42	0	39	0	0
All	All	15475	0	14303	79	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (79) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:530:MET:HG2	2:D:628:TRP:NE1	2.09	0.68
1:E:427:TRP:HD1	1:E:475:MET:HG3	1.60	0.66
1:C:498:PRO:HD2	2:D:631:TRP:CZ2	2.31	0.65
1:C:497:ALA:HB2	2:D:631:TRP:NE1	2.11	0.65
1:A:37:THR:HB	1:A:499:THR:HG21	1.78	0.63
1:A:426:MET:HB2	1:A:429:ARG:HH22	1.68	0.59
1:C:255:VAL:O	1:C:255:VAL:HG23	2.03	0.57
1:A:434:MET:SD	1:A:434:MET:C	2.87	0.57
1:C:44:VAL:HG11	2:D:632:ASP:CG	2.29	0.57

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:44:VAL:HG11	2:D:632:ASP:OD1	2.05	0.56
1:A:69:TRP:HZ3	1:A:210:PHE:C	2.14	0.56
1:C:72:HIS:ND1	1:C:72:HIS:N	2.50	0.56
1:C:427:TRP:CD1	1:C:475:MET:HG3	2.43	0.54
3:H:98:UNK:C	3:H:100:UNK:N	2.70	0.54
1:C:497:ALA:HA	2:D:631:TRP:HZ2	1.72	0.53
1:C:44:VAL:CG1	2:D:632:ASP:CG	2.81	0.53
9:B:702:NAG:O7	9:B:702:NAG:O3	2.20	0.53
1:C:43:PRO:HG2	2:D:628:TRP:HB2	1.91	0.53
1:E:426:MET:HE3	1:E:427:TRP:CE2	2.43	0.52
1:C:175:LEU:HD21	5:J:1:NAG:H82	1.91	0.52
3:H:82:UNK:O	3:H:83:UNK:C	2.56	0.52
1:A:37:THR:HB	1:A:499:THR:CG2	2.39	0.51
1:E:428:GLN:HG2	1:E:428:GLN:O	2.11	0.51
1:A:446:VAL:HB	6:M:2:NAG:H81	1.91	0.51
1:E:46:LYS:NZ	1:E:492:GLU:OE1	2.41	0.50
1:C:498:PRO:CD	2:D:631:TRP:CZ2	2.95	0.49
1:C:501:CYS:O	1:C:502:LYS:C	2.55	0.49
2:F:657:GLU:O	2:F:661:LEU:HG	2.12	0.49
1:E:109:ILE:HA	1:E:427:TRP:CZ3	2.48	0.48
1:C:377:ASN:C	1:C:377:ASN:OD1	2.56	0.48
1:A:429:ARG:HB3	1:A:429:ARG:NH1	2.28	0.48
1:A:503:ARG:HB2	2:B:606:THR:HA	1.94	0.48
2:B:616:ASN:O	2:B:616:ASN:CG	2.56	0.47
2:B:616:ASN:O	2:B:616:ASN:OD1	2.32	0.47
1:E:427:TRP:CD1	1:E:475:MET:HG3	2.44	0.47
1:A:429:ARG:HG2	1:A:429:ARG:O	2.13	0.47
2:B:621:GLU:HG3	9:B:702:NAG:H82	1.95	0.47
1:A:490:LYS:NZ	1:A:492:GLU:OE2	2.47	0.47
1:A:426:MET:HB3	1:A:427:TRP:CE3	2.50	0.46
2:B:561:CYS:SG	2:B:562:GLN:N	2.89	0.46
1:A:123:THR:N	1:A:124:PRO:HD2	2.30	0.46
1:A:424:ILE:HD12	1:A:436:ALA:HB2	1.97	0.46
3:H:98:UNK:C	3:H:100:UNK:H	2.28	0.46
2:B:520:LEU:HG	2:B:520:LEU:O	2.15	0.46
1:A:374:HIS:CE1	1:A:376:PHE:HB2	2.50	0.46
9:B:702:NAG:HO3	9:B:702:NAG:C7	2.23	0.45
1:A:35:TRP:CD1	1:A:502:LYS:HB3	2.52	0.45
1:A:355:ASN:OD1	1:A:355:ASN:N	2.48	0.45
1:E:109:ILE:HG12	1:E:427:TRP:CE3	2.52	0.45
1:A:280:ASN:N	1:A:280:ASN:OD1	2.49	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:497:ALA:HA	2:D:631:TRP:CZ2	2.52	0.45
2:D:530:MET:HG2	2:D:628:TRP:CE2	2.52	0.44
1:E:356:ASN:OD1	1:E:356:ASN:N	2.46	0.44
2:F:656:ASN:O	2:F:660:LEU:HB3	2.18	0.44
1:E:123:THR:N	1:E:124:PRO:HD2	2.32	0.44
1:C:497:ALA:HB2	2:D:631:TRP:CE2	2.53	0.43
4:L:63:UNK:O	4:L:65:UNK:N	2.51	0.43
1:A:429:ARG:HB3	1:A:429:ARG:CZ	2.49	0.43
2:D:564:HIS:O	2:D:564:HIS:CG	2.71	0.43
1:A:503:ARG:HB2	2:B:606:THR:CA	2.49	0.43
1:C:67:ASN:OD1	1:C:68:VAL:N	2.52	0.43
2:F:659:ASP:O	2:F:662:ALA:N	2.52	0.42
1:C:43:PRO:HD2	2:D:628:TRP:CG	2.55	0.42
1:A:105:HIS:O	1:A:108:ILE:HG22	2.20	0.42
2:D:629:LEU:HD22	2:D:629:LEU:N	2.34	0.42
2:D:635:ILE:HG22	2:D:635:ILE:O	2.19	0.42
1:A:429:ARG:NH1	1:A:429:ARG:CB	2.82	0.42
1:C:363:ASN:O	1:C:469:ARG:HD2	2.20	0.42
1:C:498:PRO:CD	2:D:631:TRP:HZ2	2.33	0.42
1:C:43:PRO:CG	2:D:628:TRP:HB2	2.48	0.41
1:C:447:SER:HB3	5:I:1:NAG:HN2	1.85	0.41
2:D:639:THR:O	2:D:640:GLN:C	2.64	0.41
2:B:611:ASN:HB3	2:B:614:TRP:CE2	2.55	0.41
1:A:37:THR:OG1	1:A:38:VAL:N	2.54	0.41
2:D:639:THR:O	2:D:642:ILE:N	2.53	0.41
1:A:431:GLY:O	1:A:432:GLN:HB2	2.21	0.41
4:L:84:UNK:O	4:L:85:UNK:C	2.68	0.40
2:D:623:TRP:HB2	2:D:624:ASP:H	1.60	0.40
1:A:35:TRP:O	1:A:499:THR:HG22	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	430/503 (86%)	418 (97%)	12 (3%)	0	100	100
1	C	420/503 (84%)	411 (98%)	9 (2%)	0	100	100
1	E	421/503 (84%)	413 (98%)	8 (2%)	0	100	100
2	B	122/145 (84%)	118 (97%)	4 (3%)	0	100	100
2	D	128/145 (88%)	116 (91%)	12 (9%)	0	100	100
2	F	114/145 (79%)	112 (98%)	2 (2%)	0	100	100
All	All	1635/1944 (84%)	1588 (97%)	47 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	393/447 (88%)	393 (100%)	0	100	100
1	C	387/447 (87%)	387 (100%)	0	100	100
1	E	388/447 (87%)	388 (100%)	0	100	100
2	B	109/126 (86%)	109 (100%)	0	100	100
2	D	114/126 (90%)	114 (100%)	0	100	100
2	F	101/126 (80%)	101 (100%)	0	100	100
All	All	1492/1719 (87%)	1492 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	188	ASN
1	C	280	ASN
2	D	543	ASN
2	D	564	HIS
2	D	591	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	246	GLN
1	A	422	GLN
1	A	425	ASN
2	B	562	GLN
2	B	563	GLN
2	B	591	GLN
2	B	652	GLN
1	E	130	GLN
1	E	216	HIS
1	E	425	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates ⓘ

35 monosaccharides are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
5	NAG	G	1	1,5	14,14,15	2.10	4 (28%)	17,19,21	0.96	1 (5%)
5	NAG	G	2	5	14,14,15	1.94	5 (35%)	17,19,21	0.99	1 (5%)
5	NAG	I	1	1,5	14,14,15	0.39	0	17,19,21	0.62	0
5	NAG	I	2	5	14,14,15	0.39	0	17,19,21	0.40	0
5	NAG	J	1	1,5	14,14,15	2.18	6 (42%)	17,19,21	1.12	1 (5%)
5	NAG	J	2	5	14,14,15	1.99	4 (28%)	17,19,21	0.88	0
5	NAG	K	1	1,5	14,14,15	2.25	5 (35%)	17,19,21	1.15	2 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
5	NAG	K	2	5	14,14,15	1.95	5 (35%)	17,19,21	0.93	1 (5%)
6	NAG	M	1	6,1	14,14,15	1.89	3 (21%)	17,19,21	1.26	0
6	NAG	M	2	6	14,14,15	1.92	5 (35%)	17,19,21	1.19	1 (5%)
6	BMA	M	3	6	11,11,12	0.55	0	15,15,17	0.75	0
6	MAN	M	4	6	11,11,12	0.71	0	15,15,17	0.78	0
6	MAN	M	5	6	11,11,12	1.92	5 (45%)	15,15,17	0.62	0
5	NAG	N	1	1,5	14,14,15	2.00	4 (28%)	17,19,21	1.05	1 (5%)
5	NAG	N	2	5	14,14,15	1.90	5 (35%)	17,19,21	0.94	1 (5%)
5	NAG	O	1	2,5	14,14,15	2.18	6 (42%)	17,19,21	1.15	3 (17%)
5	NAG	O	2	5	14,14,15	0.37	0	17,19,21	0.49	0
7	NAG	P	1	7,2	14,14,15	0.44	0	17,19,21	0.63	0
7	NAG	P	2	7	14,14,15	0.42	0	17,19,21	0.85	0
7	BMA	P	3	7	11,11,12	0.99	1 (9%)	15,15,17	0.81	0
7	MAN	P	4	7	11,11,12	1.20	1 (9%)	15,15,17	1.99	6 (40%)
7	MAN	P	5	7	11,11,12	0.41	0	15,15,17	0.66	0
7	MAN	P	6	7	11,11,12	0.59	0	15,15,17	0.75	0
7	MAN	P	7	7	11,11,12	0.38	0	15,15,17	0.63	0
5	NAG	Q	1	1,5	14,14,15	2.20	7 (50%)	17,19,21	1.32	2 (11%)
5	NAG	Q	2	5	14,14,15	2.07	5 (35%)	17,19,21	0.95	2 (11%)
5	NAG	R	1	1,5	14,14,15	2.33	5 (35%)	17,19,21	0.94	1 (5%)
5	NAG	R	2	5	14,14,15	1.96	5 (35%)	17,19,21	0.90	1 (5%)
8	NAG	S	1	1,8	14,14,15	1.96	3 (21%)	17,19,21	1.21	2 (11%)
8	NAG	S	2	8	14,14,15	1.89	5 (35%)	17,19,21	1.02	2 (11%)
8	BMA	S	3	8	11,11,12	1.38	2 (18%)	15,15,17	0.58	0
8	MAN	S	4	8	11,11,12	0.71	0	15,15,17	0.73	0
8	MAN	S	5	8	11,11,12	1.82	4 (36%)	15,15,17	0.78	0
5	NAG	T	1	1,5	14,14,15	2.06	5 (35%)	17,19,21	1.01	0
5	NAG	T	2	5	14,14,15	1.95	5 (35%)	17,19,21	0.88	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	G	1	1,5	-	0/6/23/26	0/1/1/1
5	NAG	G	2	5	-	0/6/23/26	0/1/1/1
5	NAG	I	1	1,5	-	0/6/23/26	0/1/1/1

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	I	2	5	-	3/6/23/26	0/1/1/1
5	NAG	J	1	1,5	-	0/6/23/26	0/1/1/1
5	NAG	J	2	5	-	1/6/23/26	0/1/1/1
5	NAG	K	1	1,5	-	2/6/23/26	0/1/1/1
5	NAG	K	2	5	-	0/6/23/26	0/1/1/1
6	NAG	M	1	6,1	-	0/6/23/26	0/1/1/1
6	NAG	M	2	6	-	0/6/23/26	0/1/1/1
6	BMA	M	3	6	-	1/2/19/22	0/1/1/1
6	MAN	M	4	6	-	2/2/19/22	0/1/1/1
6	MAN	M	5	6	-	0/2/19/22	0/1/1/1
5	NAG	N	1	1,5	-	0/6/23/26	0/1/1/1
5	NAG	N	2	5	-	0/6/23/26	0/1/1/1
5	NAG	O	1	2,5	-	0/6/23/26	0/1/1/1
5	NAG	O	2	5	-	0/6/23/26	0/1/1/1
7	NAG	P	1	7,2	-	4/6/23/26	0/1/1/1
7	NAG	P	2	7	-	4/6/23/26	0/1/1/1
7	BMA	P	3	7	-	0/2/19/22	0/1/1/1
7	MAN	P	4	7	-	0/2/19/22	0/1/1/1
7	MAN	P	5	7	-	2/2/19/22	0/1/1/1
7	MAN	P	6	7	-	2/2/19/22	0/1/1/1
7	MAN	P	7	7	-	2/2/19/22	0/1/1/1
5	NAG	Q	1	1,5	-	0/6/23/26	0/1/1/1
5	NAG	Q	2	5	-	1/6/23/26	0/1/1/1
5	NAG	R	1	1,5	-	0/6/23/26	0/1/1/1
5	NAG	R	2	5	-	0/6/23/26	0/1/1/1
8	NAG	S	1	1,8	-	0/6/23/26	0/1/1/1
8	NAG	S	2	8	-	0/6/23/26	0/1/1/1
8	BMA	S	3	8	-	0/2/19/22	0/1/1/1
8	MAN	S	4	8	-	1/2/19/22	0/1/1/1
8	MAN	S	5	8	-	1/2/19/22	0/1/1/1
5	NAG	T	1	1,5	-	0/6/23/26	0/1/1/1
5	NAG	T	2	5	-	1/6/23/26	0/1/1/1

All (105) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	R	1	NAG	C1-C2	6.43	1.61	1.52
5	K	1	NAG	C1-C2	6.26	1.60	1.52
5	G	1	NAG	C1-C2	5.78	1.60	1.52
5	O	1	NAG	C1-C2	5.64	1.60	1.52

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	J	1	NAG	C1-C2	5.43	1.59	1.52
5	Q	1	NAG	C1-C2	5.36	1.59	1.52
5	N	1	NAG	C1-C2	5.20	1.59	1.52
8	S	1	NAG	C1-C2	5.12	1.59	1.52
5	T	1	NAG	C1-C2	4.97	1.59	1.52
6	M	1	NAG	C1-C2	4.77	1.58	1.52
5	Q	2	NAG	C1-C2	4.76	1.58	1.52
5	J	2	NAG	C1-C2	4.72	1.58	1.52
5	K	2	NAG	C1-C2	4.67	1.58	1.52
6	M	2	NAG	C1-C2	4.63	1.58	1.52
5	R	2	NAG	C1-C2	4.57	1.58	1.52
5	G	2	NAG	C1-C2	4.56	1.58	1.52
5	T	2	NAG	C1-C2	4.38	1.58	1.52
8	S	2	NAG	C1-C2	4.15	1.58	1.52
5	N	2	NAG	C1-C2	4.12	1.58	1.52
5	Q	2	NAG	O5-C5	3.27	1.49	1.43
5	T	1	NAG	O5-C5	3.26	1.49	1.43
6	M	5	MAN	O5-C5	3.23	1.49	1.43
5	N	2	NAG	O5-C5	3.20	1.49	1.43
5	J	2	NAG	O5-C5	3.19	1.49	1.43
5	R	1	NAG	O5-C5	3.17	1.49	1.43
5	R	2	NAG	O5-C5	3.16	1.49	1.43
5	T	2	NAG	O5-C5	3.14	1.49	1.43
5	J	1	NAG	O5-C5	3.11	1.49	1.43
6	M	5	MAN	C2-C3	3.11	1.57	1.52
8	S	2	NAG	O5-C5	3.05	1.49	1.43
5	K	2	NAG	O5-C5	3.04	1.49	1.43
8	S	5	MAN	C2-C3	3.00	1.57	1.52
8	S	5	MAN	O5-C5	2.99	1.49	1.43
5	G	2	NAG	O5-C5	2.96	1.49	1.43
6	M	1	NAG	O5-C5	2.94	1.49	1.43
5	Q	1	NAG	O5-C5	2.85	1.49	1.43
5	O	1	NAG	O5-C5	2.80	1.48	1.43
6	M	2	NAG	O5-C5	2.76	1.48	1.43
5	K	1	NAG	O5-C5	2.73	1.48	1.43
8	S	1	NAG	O5-C5	2.68	1.48	1.43
5	Q	2	NAG	C3-C2	2.63	1.58	1.52
5	N	1	NAG	O5-C5	2.62	1.48	1.43
5	G	1	NAG	O5-C5	2.58	1.48	1.43
5	J	1	NAG	C4-C5	2.55	1.58	1.53
5	Q	2	NAG	C4-C5	2.50	1.58	1.53
5	O	1	NAG	O5-C1	2.50	1.47	1.43

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	K	1	NAG	C3-C2	2.49	1.57	1.52
5	Q	1	NAG	C2-N2	2.48	1.50	1.46
8	S	2	NAG	C4-C5	2.48	1.58	1.53
5	Q	1	NAG	C3-C2	2.47	1.57	1.52
5	G	2	NAG	C3-C2	2.46	1.57	1.52
6	M	5	MAN	C1-C2	2.45	1.58	1.52
5	T	2	NAG	C4-C5	2.42	1.58	1.53
5	T	1	NAG	O5-C1	2.41	1.47	1.43
6	M	1	NAG	C4-C5	2.41	1.58	1.53
6	M	2	NAG	C4-C5	2.40	1.58	1.53
8	S	3	BMA	O5-C5	2.39	1.48	1.43
5	N	2	NAG	C3-C2	2.38	1.57	1.52
5	K	2	NAG	C3-C2	2.38	1.57	1.52
5	N	2	NAG	C4-C5	2.37	1.58	1.53
5	J	2	NAG	C4-C5	2.37	1.58	1.53
6	M	5	MAN	C4-C5	2.36	1.58	1.53
5	T	2	NAG	C3-C2	2.36	1.57	1.52
8	S	5	MAN	C4-C5	2.35	1.58	1.53
5	N	1	NAG	O5-C1	2.35	1.47	1.43
5	T	1	NAG	C3-C2	2.34	1.57	1.52
5	R	2	NAG	C4-C5	2.34	1.58	1.53
5	J	2	NAG	C3-C2	2.33	1.57	1.52
5	J	1	NAG	C3-C2	2.32	1.57	1.52
5	R	2	NAG	C3-C2	2.31	1.57	1.52
5	O	1	NAG	C4-C3	2.30	1.58	1.52
5	R	1	NAG	C3-C2	2.30	1.57	1.52
8	S	1	NAG	C3-C2	2.30	1.57	1.52
5	R	1	NAG	O5-C1	2.28	1.47	1.43
5	Q	1	NAG	C4-C3	2.28	1.58	1.52
5	T	1	NAG	C4-C5	2.27	1.57	1.53
8	S	2	NAG	C3-C2	2.27	1.57	1.52
5	J	1	NAG	O5-C1	2.25	1.47	1.43
5	O	1	NAG	C4-C5	2.24	1.57	1.53
8	S	5	MAN	C1-C2	2.24	1.57	1.52
5	Q	1	NAG	O5-C1	2.22	1.47	1.43
5	G	2	NAG	C4-C5	2.21	1.57	1.53
5	G	1	NAG	C3-C2	2.20	1.57	1.52
7	P	3	BMA	O5-C1	-2.20	1.40	1.43
5	K	2	NAG	C4-C5	2.20	1.57	1.53
5	Q	1	NAG	C4-C5	2.19	1.57	1.53
6	M	2	NAG	C4-C3	2.19	1.58	1.52
5	O	1	NAG	C3-C2	2.19	1.57	1.52

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	N	1	NAG	C3-C2	2.19	1.57	1.52
5	G	1	NAG	C4-C3	2.13	1.57	1.52
5	T	2	NAG	C4-C3	2.08	1.57	1.52
5	N	2	NAG	C4-C3	2.07	1.57	1.52
5	R	2	NAG	C4-C3	2.07	1.57	1.52
5	Q	2	NAG	C4-C3	2.06	1.57	1.52
8	S	3	BMA	C1-C2	2.06	1.57	1.52
6	M	2	NAG	C3-C2	2.05	1.56	1.52
8	S	2	NAG	C4-C3	2.05	1.57	1.52
6	M	5	MAN	C4-C3	2.05	1.57	1.52
5	K	1	NAG	C4-C5	2.04	1.57	1.53
7	P	4	MAN	C2-C3	-2.03	1.49	1.52
5	G	2	NAG	C4-C3	2.03	1.57	1.52
5	K	2	NAG	C2-N2	2.02	1.49	1.46
5	K	1	NAG	C4-C3	2.02	1.57	1.52
5	R	1	NAG	C4-C5	2.02	1.57	1.53
5	J	1	NAG	C4-C3	2.00	1.57	1.52

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	P	4	MAN	C3-C4-C5	-4.02	102.94	110.23
5	Q	1	NAG	C8-C7-N2	3.43	121.81	116.12
6	M	2	NAG	C8-C7-N2	3.16	121.36	116.12
7	P	4	MAN	O2-C2-C3	-2.92	104.10	110.15
5	K	1	NAG	C8-C7-N2	2.85	120.85	116.12
8	S	1	NAG	C1-C2-N2	-2.72	106.15	110.43
7	P	4	MAN	C1-O5-C5	-2.63	108.66	112.19
7	P	4	MAN	C2-C3-C4	-2.50	106.47	110.86
5	Q	2	NAG	C8-C7-N2	2.47	120.21	116.12
8	S	2	NAG	C8-C7-N2	2.46	120.20	116.12
7	P	4	MAN	O5-C1-C2	-2.46	104.93	110.79
5	Q	1	NAG	O7-C7-C8	-2.44	117.71	122.05
5	N	1	NAG	C8-C7-N2	2.42	120.13	116.12
5	G	2	NAG	C8-C7-N2	2.39	120.08	116.12
5	J	1	NAG	C8-C7-N2	2.39	120.08	116.12
5	K	2	NAG	C8-C7-N2	2.29	119.91	116.12
5	R	1	NAG	C8-C7-N2	2.28	119.90	116.12
5	O	1	NAG	O5-C1-C2	-2.21	107.87	111.29
5	O	1	NAG	C8-C7-N2	2.20	119.76	116.12
8	S	1	NAG	C8-C7-N2	2.14	119.67	116.12
7	P	4	MAN	C6-C5-C4	2.11	118.20	113.02

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	S	2	NAG	O7-C7-C8	-2.10	118.31	122.05
5	N	2	NAG	C8-C7-N2	2.05	119.52	116.12
5	R	2	NAG	C8-C7-N2	2.05	119.52	116.12
5	O	1	NAG	O7-C7-C8	-2.05	118.41	122.05
5	Q	2	NAG	O7-C7-C8	-2.03	118.43	122.05
5	K	1	NAG	O7-C7-C8	-2.03	118.44	122.05
5	G	1	NAG	C8-C7-N2	2.00	119.44	116.12

There are no chirality outliers.

All (27) torsion outliers are listed below:

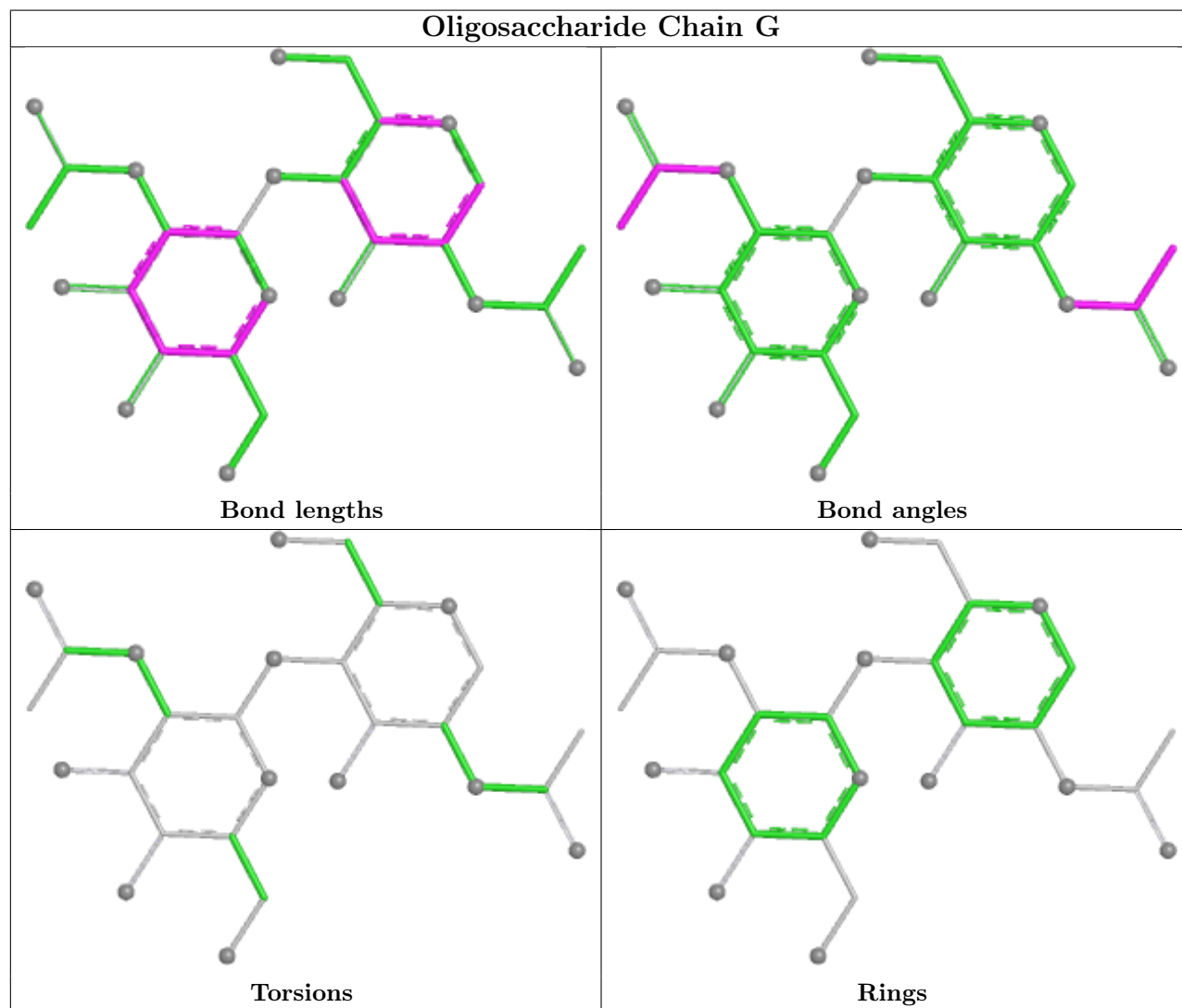
Mol	Chain	Res	Type	Atoms
7	P	1	NAG	C8-C7-N2-C2
7	P	1	NAG	O7-C7-N2-C2
7	P	2	NAG	C8-C7-N2-C2
7	P	2	NAG	O7-C7-N2-C2
7	P	2	NAG	O5-C5-C6-O6
7	P	7	MAN	O5-C5-C6-O6
7	P	7	MAN	C4-C5-C6-O6
7	P	6	MAN	C4-C5-C6-O6
7	P	6	MAN	O5-C5-C6-O6
5	I	2	NAG	C8-C7-N2-C2
5	I	2	NAG	O7-C7-N2-C2
6	M	4	MAN	O5-C5-C6-O6
7	P	1	NAG	O5-C5-C6-O6
7	P	5	MAN	O5-C5-C6-O6
5	I	2	NAG	O5-C5-C6-O6
5	Q	2	NAG	O5-C5-C6-O6
7	P	2	NAG	C4-C5-C6-O6
5	T	2	NAG	O5-C5-C6-O6
8	S	5	MAN	O5-C5-C6-O6
8	S	4	MAN	O5-C5-C6-O6
6	M	3	BMA	O5-C5-C6-O6
5	J	2	NAG	O5-C5-C6-O6
7	P	5	MAN	C4-C5-C6-O6
6	M	4	MAN	C4-C5-C6-O6
7	P	1	NAG	C4-C5-C6-O6
5	K	1	NAG	C1-C2-N2-C7
5	K	1	NAG	C4-C5-C6-O6

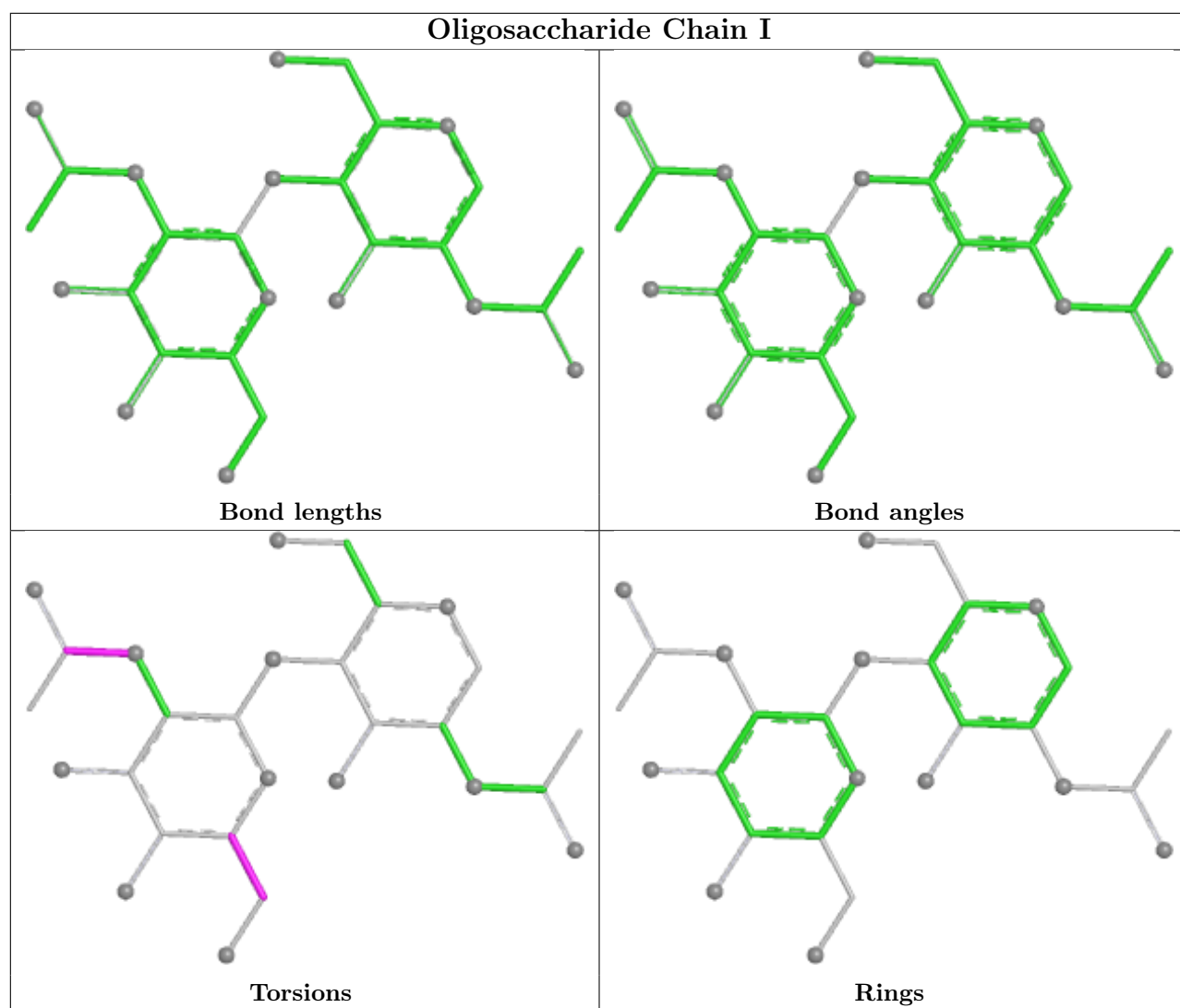
There are no ring outliers.

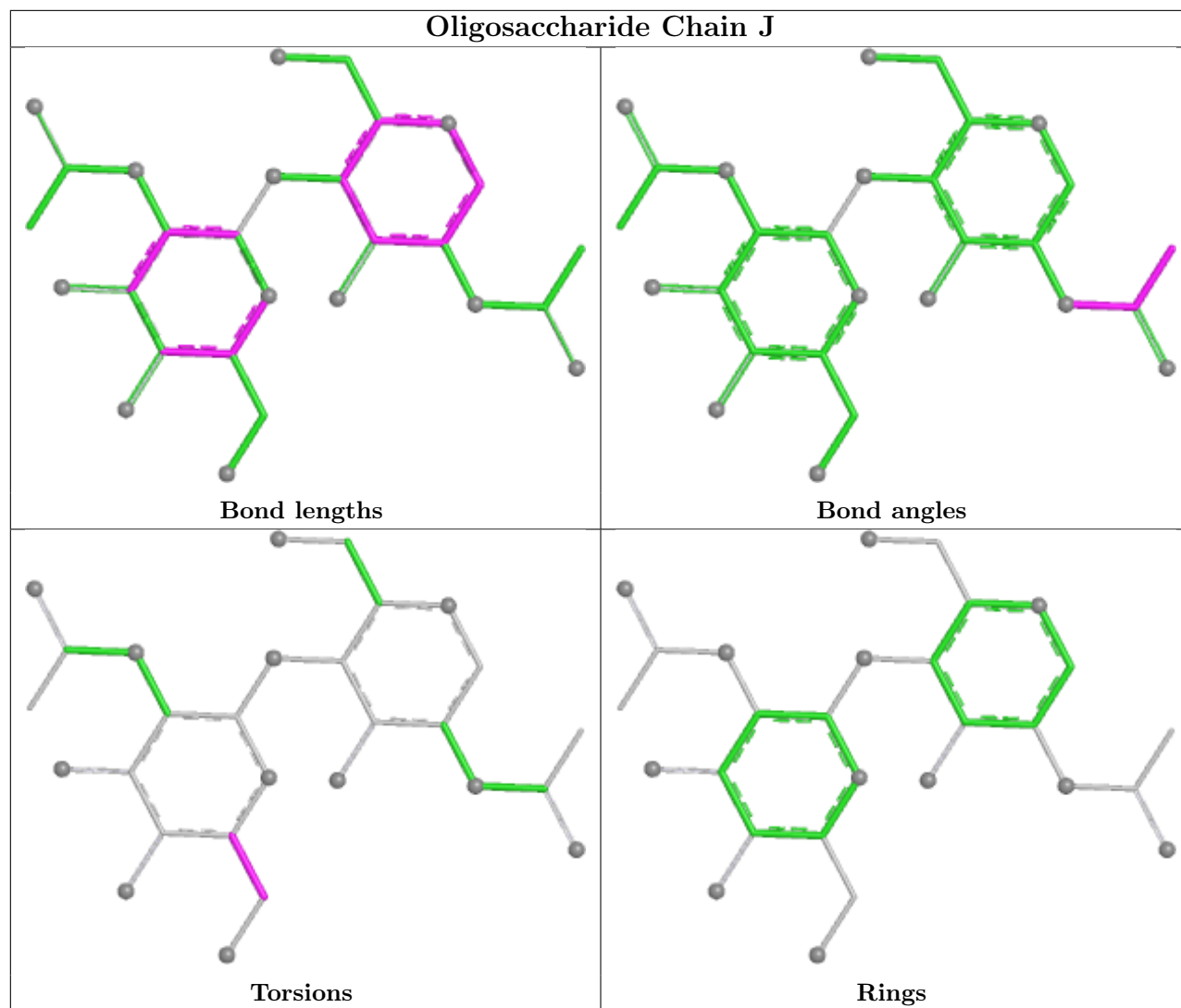
3 monomers are involved in 3 short contacts:

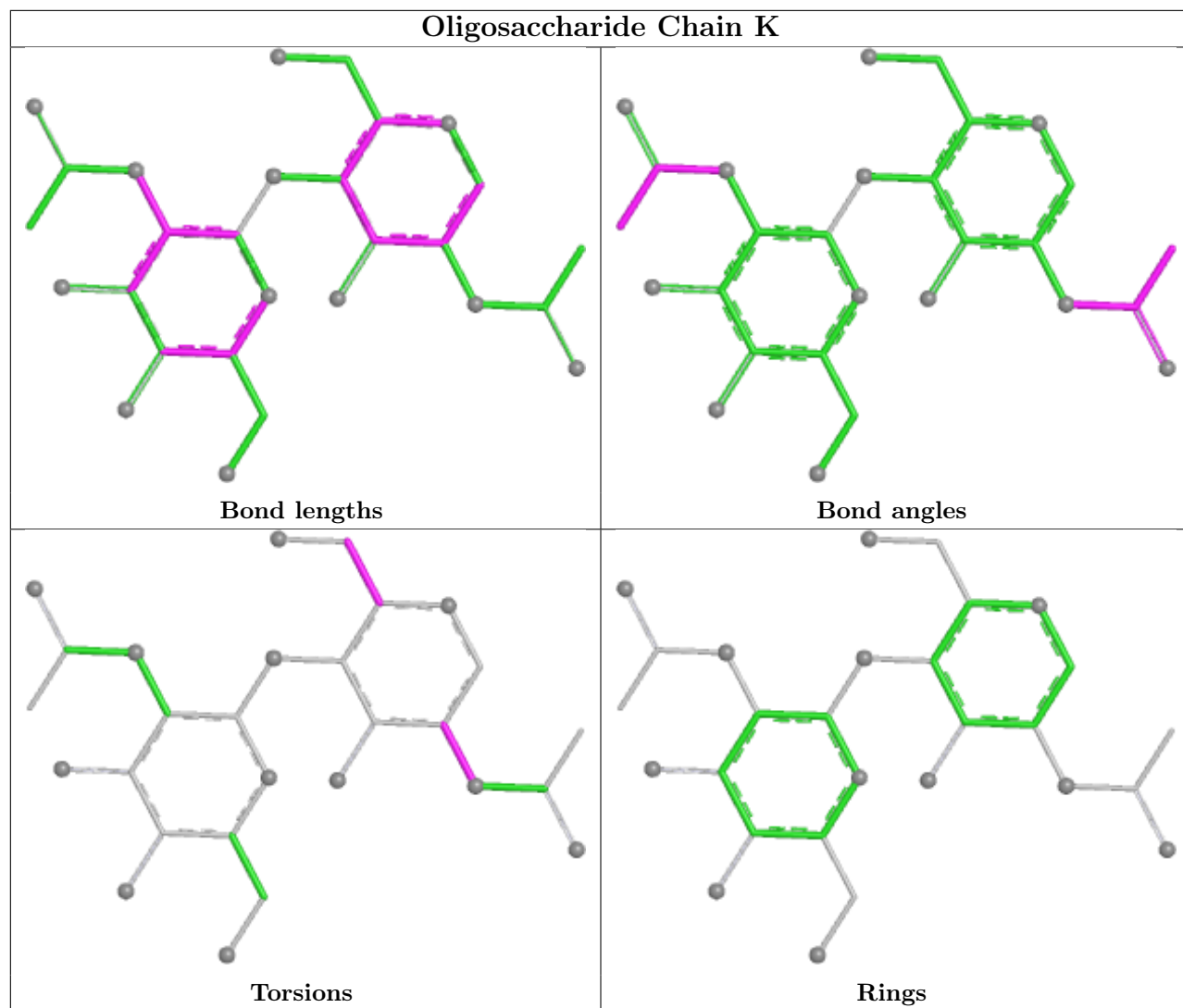
Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	M	2	NAG	1	0
5	I	1	NAG	1	0
5	J	1	NAG	1	0

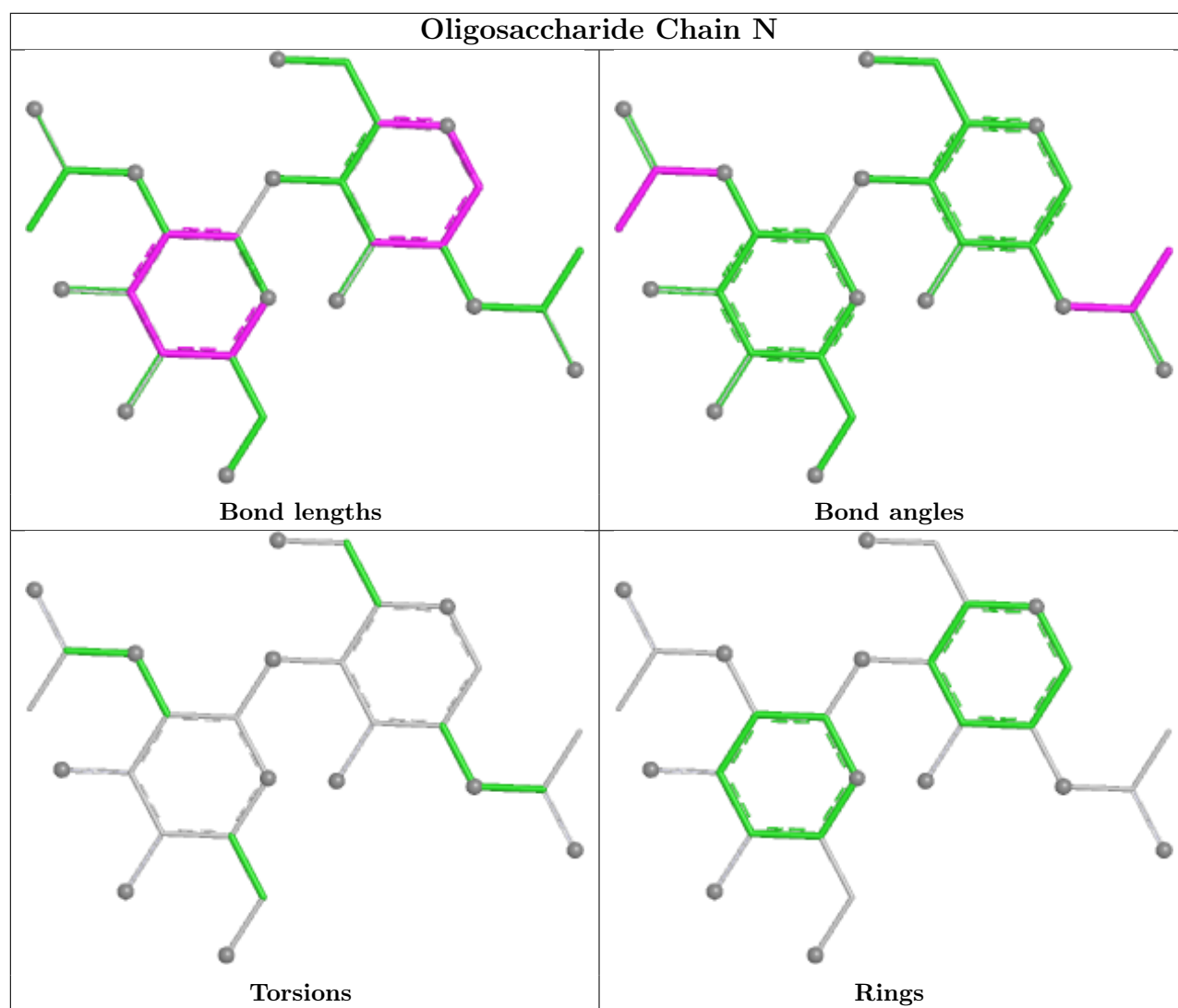
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

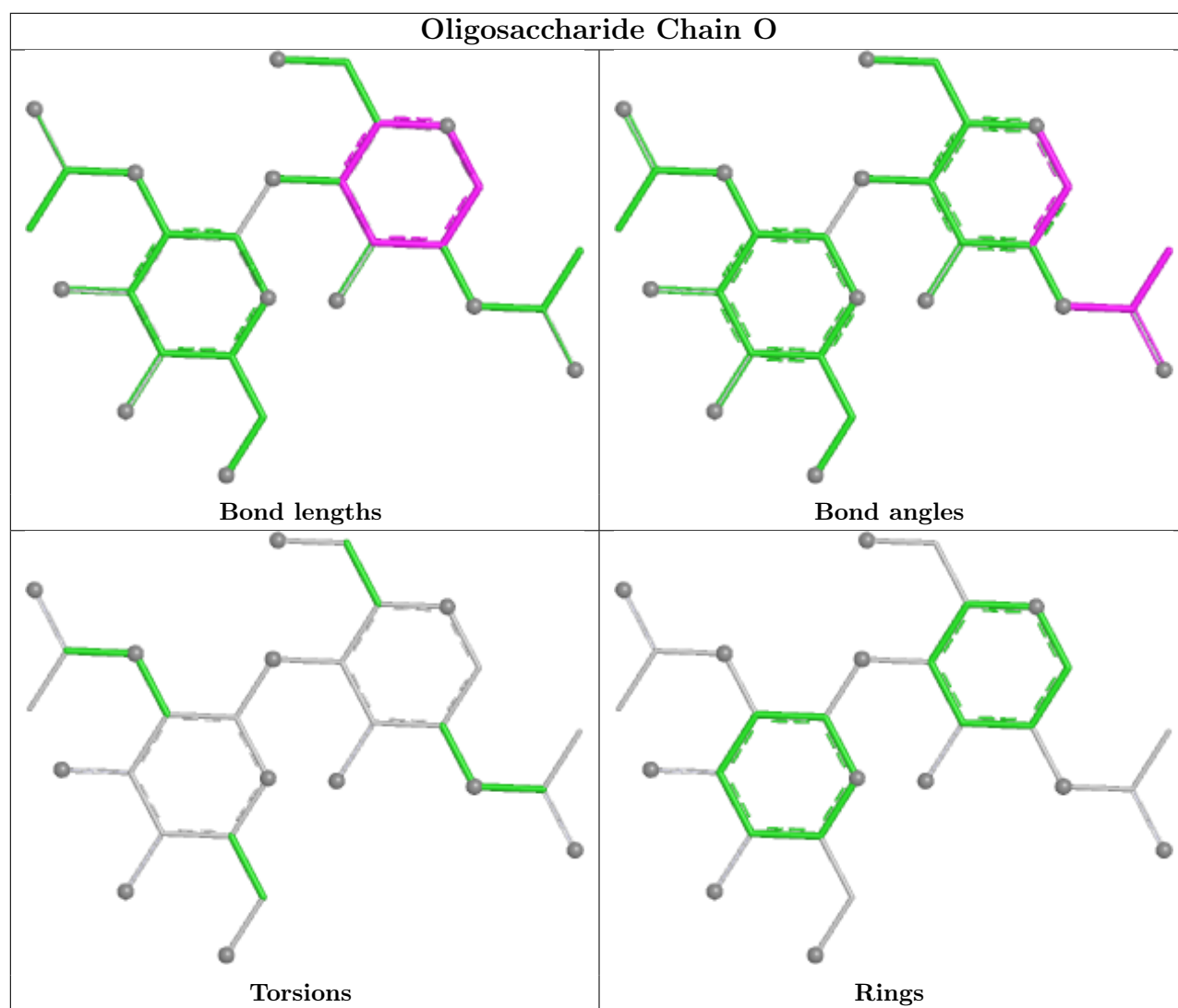


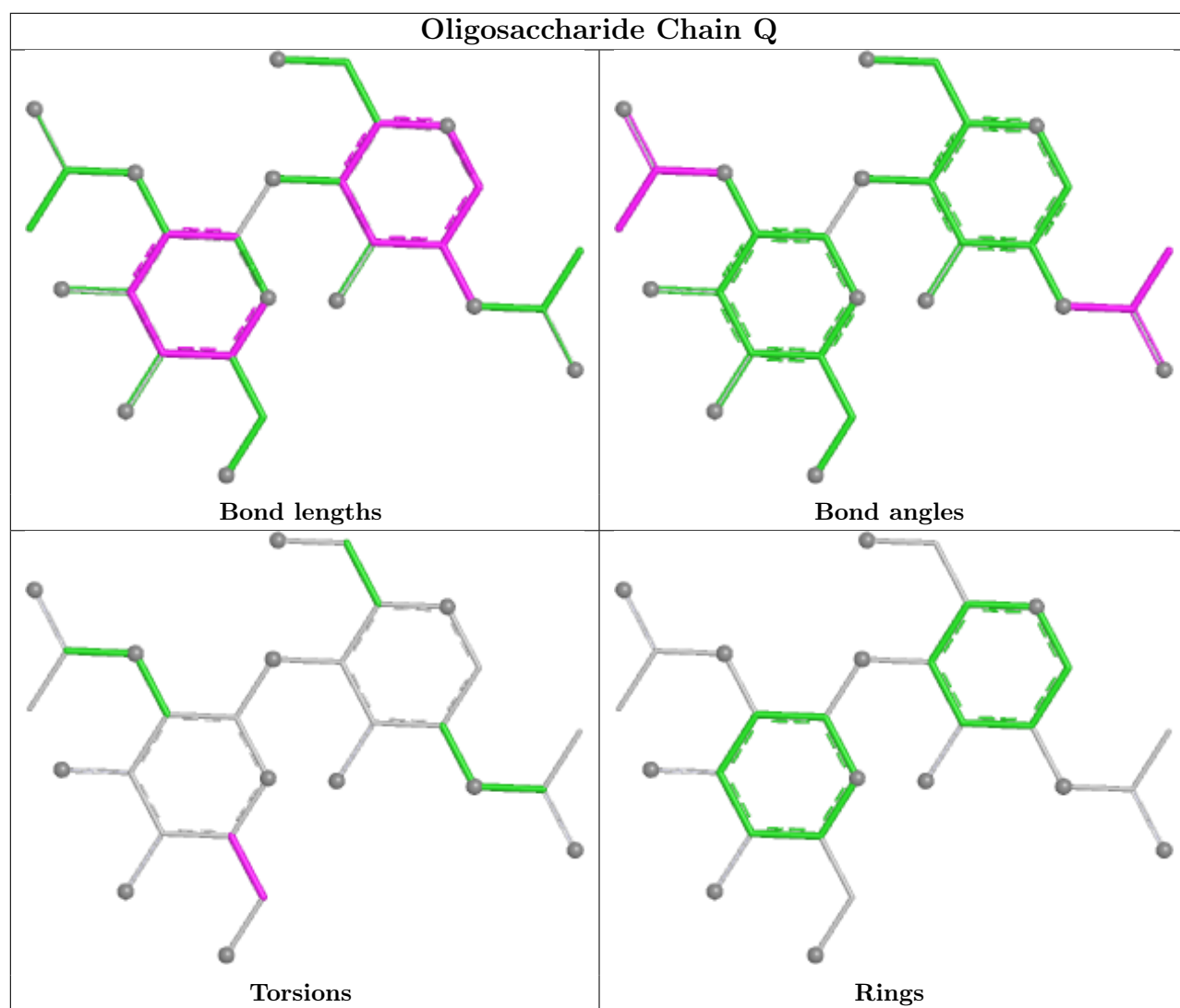


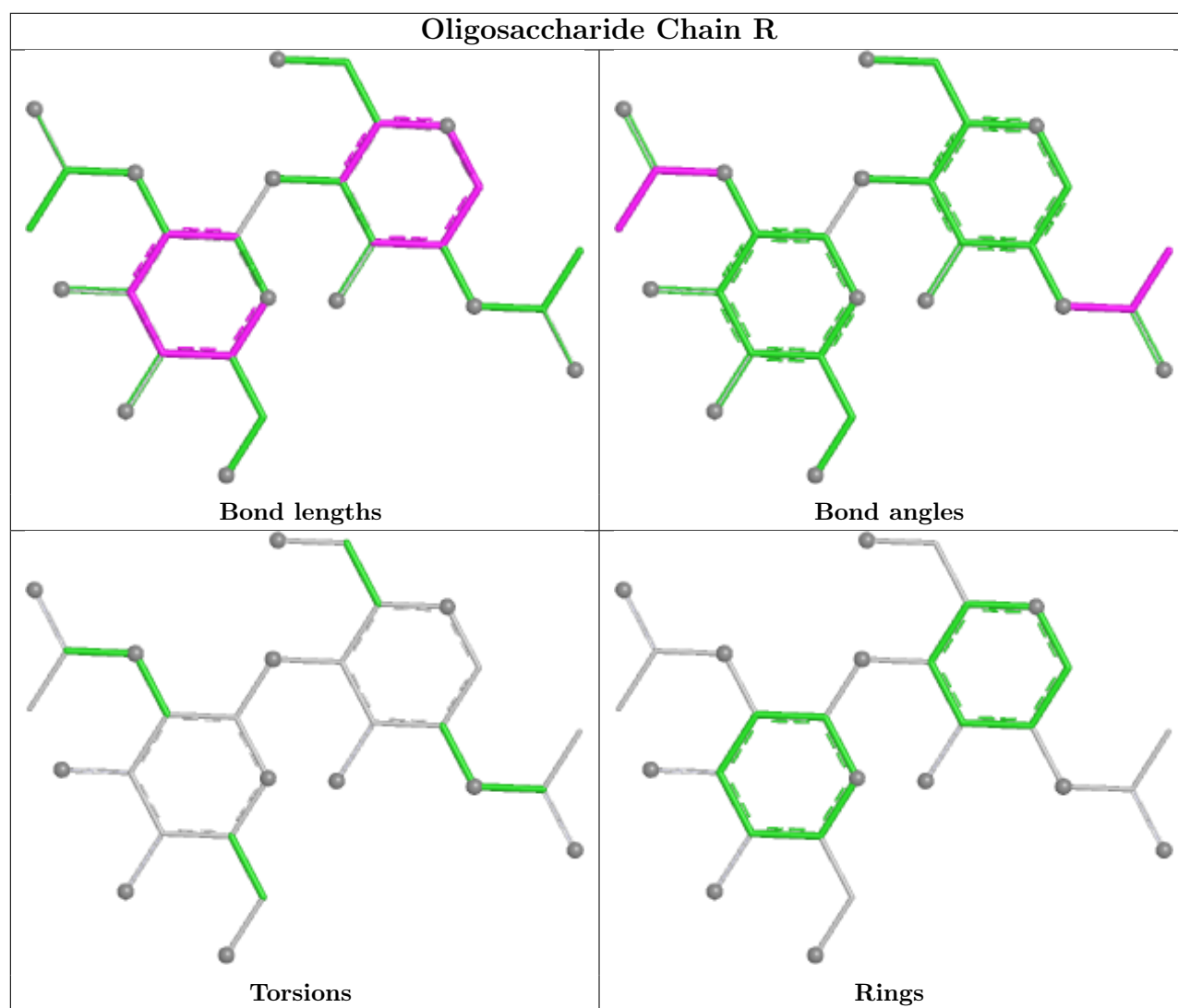


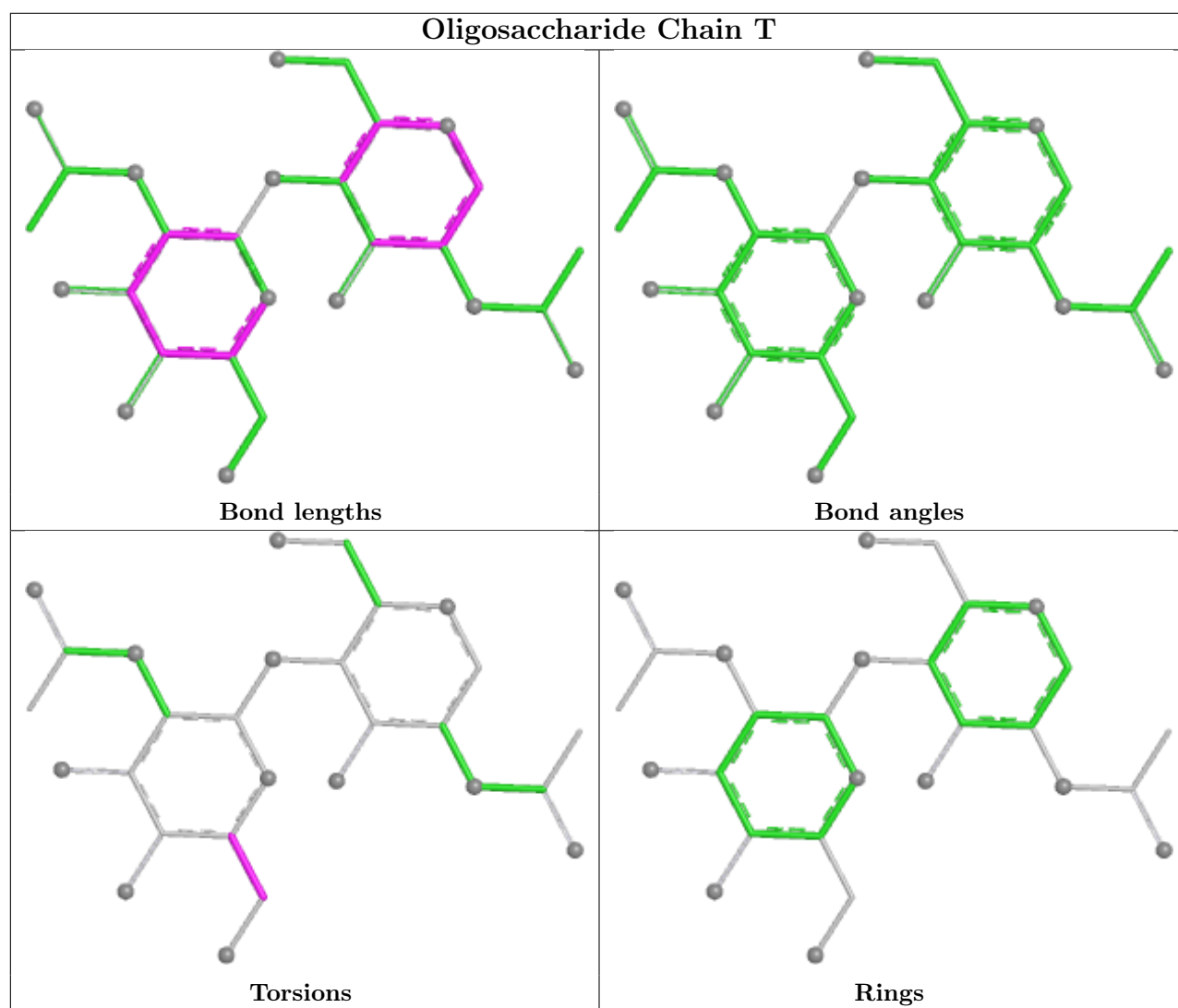


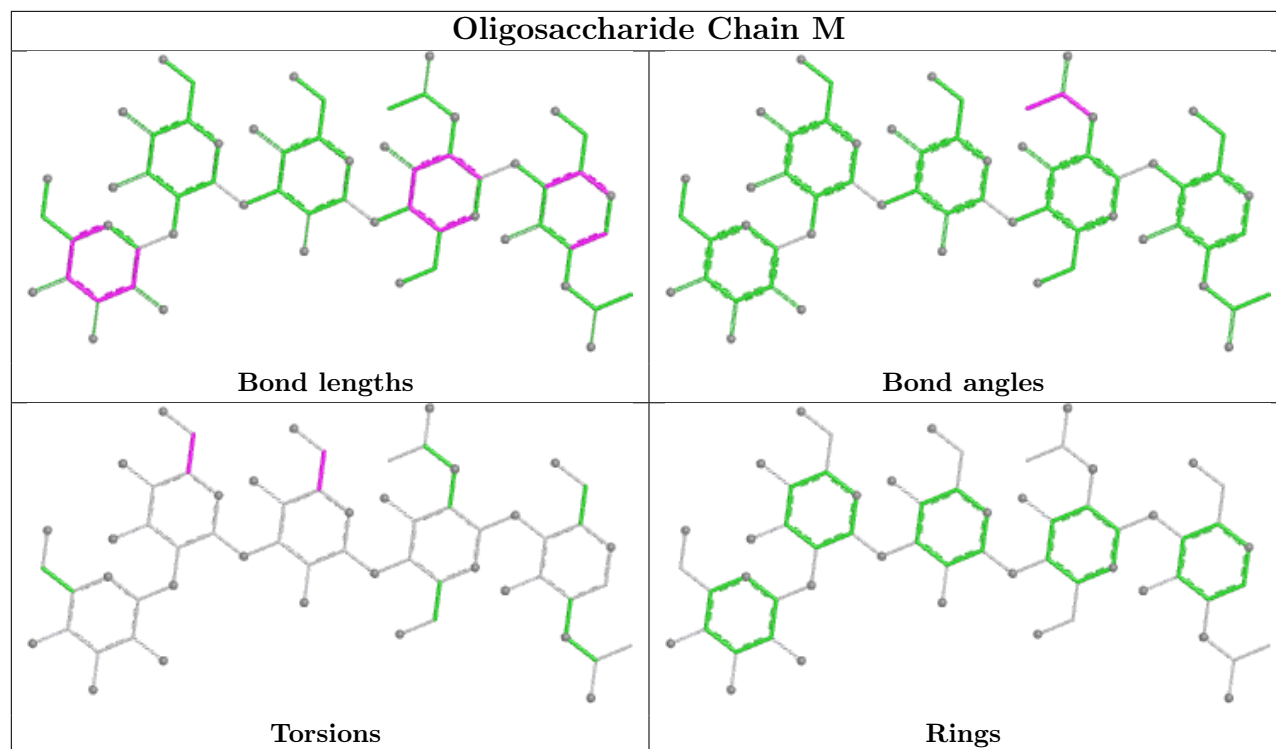


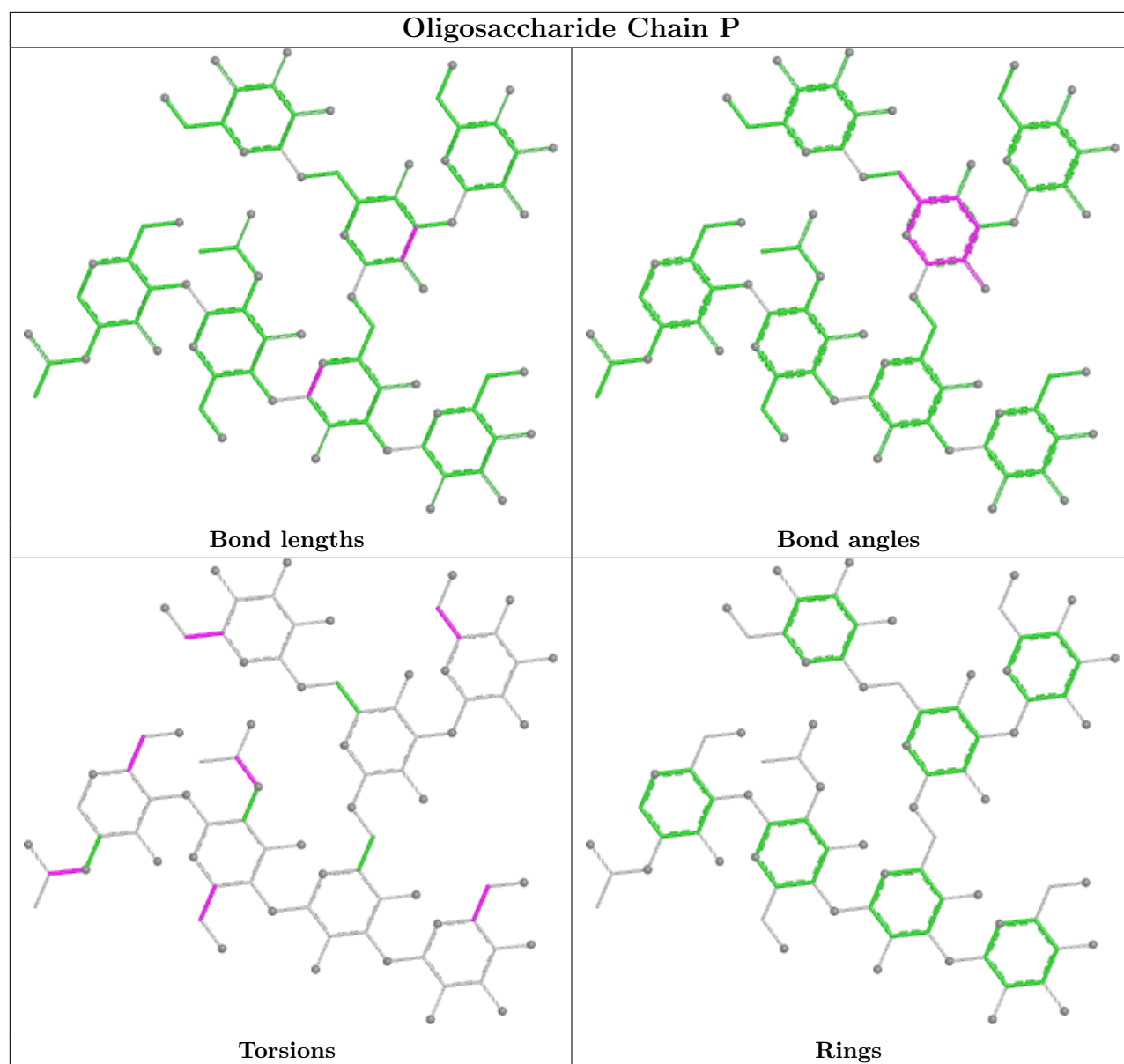


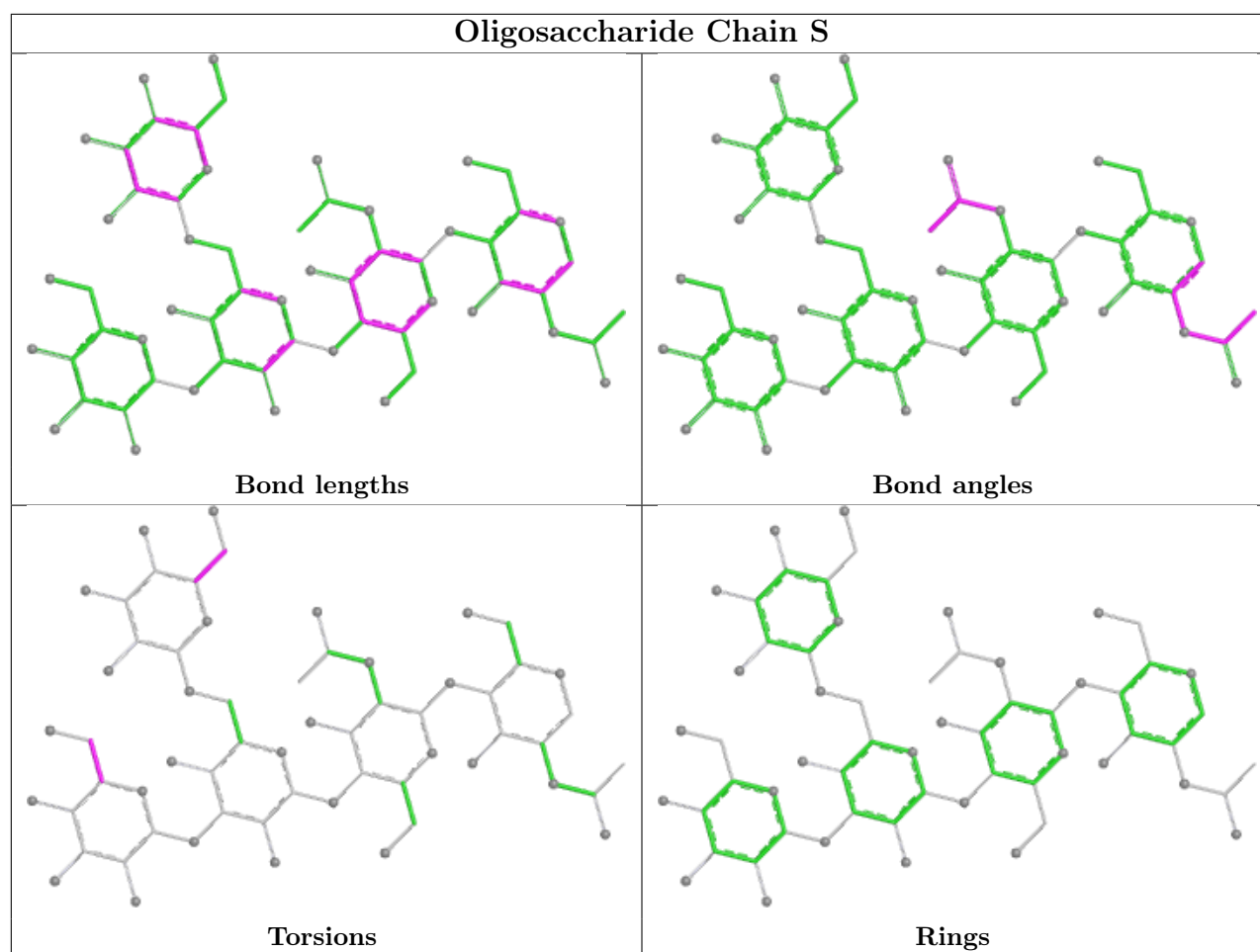












5.6 Ligand geometry [i](#)

47 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
9	NAG	E	602	1	14,14,15	2.19	5 (35%)	17,19,21	0.97	1 (5%)
9	NAG	C	609	1	14,14,15	2.24	6 (42%)	17,19,21	1.01	1 (5%)
9	NAG	C	612	1	14,14,15	2.16	5 (35%)	17,19,21	0.92	0
9	NAG	A	602	1	14,14,15	2.02	6 (42%)	17,19,21	1.06	1 (5%)
9	NAG	A	604	1	14,14,15	2.20	5 (35%)	17,19,21	1.01	2 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
9	NAG	F	703	2	14,14,15	2.22	6 (42%)	17,19,21	1.08	1 (5%)
9	NAG	C	606	1	14,14,15	2.23	5 (35%)	17,19,21	1.03	1 (5%)
9	NAG	C	602	1	14,14,15	0.37	0	17,19,21	0.45	0
9	NAG	A	603	1	14,14,15	0.38	0	17,19,21	0.51	0
9	NAG	F	701	2	14,14,15	2.29	6 (42%)	17,19,21	1.02	1 (5%)
9	NAG	C	611	1	14,14,15	2.18	4 (28%)	17,19,21	0.93	0
9	NAG	C	610	1	14,14,15	2.15	6 (42%)	17,19,21	1.04	2 (11%)
9	NAG	A	606	1	14,14,15	2.19	5 (35%)	17,19,21	1.09	2 (11%)
9	NAG	C	605	1	14,14,15	2.15	5 (35%)	17,19,21	1.02	1 (5%)
9	NAG	A	608	1	14,14,15	2.21	4 (28%)	17,19,21	1.11	2 (11%)
9	NAG	E	608	1	14,14,15	2.16	5 (35%)	17,19,21	0.91	0
9	NAG	A	614	1	14,14,15	0.39	0	17,19,21	0.50	0
9	NAG	E	603	1	14,14,15	2.12	5 (35%)	17,19,21	1.14	2 (11%)
9	NAG	B	702	2	14,14,15	0.38	0	17,19,21	0.43	0
9	NAG	A	605	1	14,14,15	2.25	6 (42%)	17,19,21	0.98	1 (5%)
9	NAG	E	601	1	14,14,15	2.04	6 (42%)	17,19,21	1.12	2 (11%)
9	NAG	A	609	1	14,14,15	2.21	6 (42%)	17,19,21	1.03	2 (11%)
9	NAG	E	606	1	14,14,15	2.22	5 (35%)	17,19,21	1.09	1 (5%)
9	NAG	C	613	1	14,14,15	2.18	5 (35%)	17,19,21	1.04	1 (5%)
9	NAG	A	601	1	14,14,15	0.38	0	17,19,21	0.51	0
9	NAG	C	603	1	14,14,15	0.39	0	17,19,21	0.56	0
9	NAG	A	610	1	14,14,15	2.28	5 (35%)	17,19,21	0.89	0
9	NAG	E	610	1	14,14,15	2.22	5 (35%)	17,19,21	1.12	1 (5%)
9	NAG	C	608	1	14,14,15	2.16	5 (35%)	17,19,21	1.15	1 (5%)
9	NAG	A	611	1	14,14,15	2.29	5 (35%)	17,19,21	0.96	1 (5%)
9	NAG	E	609	1	14,14,15	2.19	5 (35%)	17,19,21	1.01	1 (5%)
9	NAG	B	701	2	14,14,15	2.17	5 (35%)	17,19,21	0.93	1 (5%)
9	NAG	A	607	1	14,14,15	2.14	5 (35%)	17,19,21	1.13	2 (11%)
9	NAG	C	615	1	14,14,15	2.19	6 (42%)	17,19,21	1.13	3 (17%)
9	NAG	C	604	1	14,14,15	2.11	5 (35%)	17,19,21	0.99	1 (5%)
9	NAG	C	601	1	14,14,15	0.38	0	17,19,21	0.53	0
9	NAG	E	607	1	14,14,15	2.05	4 (28%)	17,19,21	1.15	3 (17%)
9	NAG	E	605	1	14,14,15	2.16	6 (42%)	17,19,21	1.03	1 (5%)
9	NAG	A	613	1	14,14,15	2.16	5 (35%)	17,19,21	1.11	2 (11%)
9	NAG	C	607	1	14,14,15	2.15	6 (42%)	17,19,21	1.11	1 (5%)
9	NAG	A	615	1	14,14,15	2.20	5 (35%)	17,19,21	1.07	2 (11%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
9	NAG	E	604	1	14,14,15	2.23	6 (42%)	17,19,21	1.07	1 (5%)
9	NAG	E	612	1	14,14,15	2.07	5 (35%)	17,19,21	1.13	3 (17%)
9	NAG	F	702	2	14,14,15	2.37	5 (35%)	17,19,21	1.09	1 (5%)
9	NAG	C	614	1	14,14,15	2.22	6 (42%)	17,19,21	1.00	1 (5%)
9	NAG	E	611	1	14,14,15	2.04	4 (28%)	17,19,21	1.02	1 (5%)
9	NAG	A	612	1	14,14,15	2.16	5 (35%)	17,19,21	0.98	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	NAG	E	602	1	-	2/6/23/26	0/1/1/1
9	NAG	C	609	1	-	0/6/23/26	0/1/1/1
9	NAG	C	612	1	-	1/6/23/26	0/1/1/1
9	NAG	A	602	1	-	2/6/23/26	0/1/1/1
9	NAG	A	604	1	-	0/6/23/26	0/1/1/1
9	NAG	F	703	2	-	0/6/23/26	0/1/1/1
9	NAG	C	606	1	-	0/6/23/26	0/1/1/1
9	NAG	C	602	1	-	4/6/23/26	0/1/1/1
9	NAG	A	603	1	-	2/6/23/26	0/1/1/1
9	NAG	F	701	2	-	0/6/23/26	0/1/1/1
9	NAG	C	611	1	-	0/6/23/26	0/1/1/1
9	NAG	C	610	1	-	2/6/23/26	0/1/1/1
9	NAG	A	606	1	-	1/6/23/26	0/1/1/1
9	NAG	C	605	1	-	1/6/23/26	0/1/1/1
9	NAG	A	608	1	-	0/6/23/26	0/1/1/1
9	NAG	E	608	1	-	1/6/23/26	0/1/1/1
9	NAG	A	614	1	-	3/6/23/26	0/1/1/1
9	NAG	E	603	1	-	1/6/23/26	0/1/1/1
9	NAG	B	702	2	-	2/6/23/26	0/1/1/1
9	NAG	A	605	1	-	1/6/23/26	0/1/1/1
9	NAG	E	601	1	-	0/6/23/26	0/1/1/1
9	NAG	A	609	1	-	0/6/23/26	0/1/1/1
9	NAG	E	606	1	-	0/6/23/26	0/1/1/1
9	NAG	C	613	1	-	0/6/23/26	0/1/1/1
9	NAG	A	601	1	-	2/6/23/26	0/1/1/1
9	NAG	C	603	1	-	2/6/23/26	0/1/1/1

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	NAG	A	610	1	-	1/6/23/26	0/1/1/1
9	NAG	E	610	1	-	1/6/23/26	0/1/1/1
9	NAG	C	608	1	-	0/6/23/26	0/1/1/1
9	NAG	A	611	1	-	0/6/23/26	0/1/1/1
9	NAG	E	609	1	-	1/6/23/26	0/1/1/1
9	NAG	B	701	2	-	0/6/23/26	0/1/1/1
9	NAG	A	607	1	-	1/6/23/26	0/1/1/1
9	NAG	C	615	1	-	0/6/23/26	0/1/1/1
9	NAG	C	604	1	-	0/6/23/26	0/1/1/1
9	NAG	C	601	1	-	3/6/23/26	0/1/1/1
9	NAG	E	607	1	-	0/6/23/26	0/1/1/1
9	NAG	E	605	1	-	0/6/23/26	0/1/1/1
9	NAG	A	613	1	-	0/6/23/26	0/1/1/1
9	NAG	C	607	1	-	1/6/23/26	0/1/1/1
9	NAG	A	615	1	-	0/6/23/26	0/1/1/1
9	NAG	E	604	1	-	0/6/23/26	0/1/1/1
9	NAG	E	612	1	-	0/6/23/26	0/1/1/1
9	NAG	F	702	2	-	1/6/23/26	0/1/1/1
9	NAG	C	614	1	-	0/6/23/26	0/1/1/1
9	NAG	E	611	1	-	0/6/23/26	0/1/1/1
9	NAG	A	612	1	-	0/6/23/26	0/1/1/1

All (209) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	F	702	NAG	C1-C2	6.72	1.61	1.52
9	F	701	NAG	C1-C2	6.39	1.61	1.52
9	A	611	NAG	C1-C2	6.29	1.60	1.52
9	A	610	NAG	C1-C2	5.97	1.60	1.52
9	C	614	NAG	C1-C2	5.91	1.60	1.52
9	E	606	NAG	C1-C2	5.89	1.60	1.52
9	A	608	NAG	C1-C2	5.87	1.60	1.52
9	C	611	NAG	C1-C2	5.87	1.60	1.52
9	A	604	NAG	C1-C2	5.86	1.60	1.52
9	C	613	NAG	C1-C2	5.81	1.60	1.52
9	C	608	NAG	C1-C2	5.79	1.60	1.52
9	C	609	NAG	C1-C2	5.79	1.60	1.52
9	A	605	NAG	C1-C2	5.78	1.60	1.52
9	E	609	NAG	C1-C2	5.77	1.60	1.52
9	A	606	NAG	C1-C2	5.71	1.60	1.52
9	E	603	NAG	C1-C2	5.68	1.60	1.52
9	F	703	NAG	C1-C2	5.68	1.60	1.52

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	E	602	NAG	C1-C2	5.68	1.60	1.52
9	C	610	NAG	C1-C2	5.65	1.60	1.52
9	C	604	NAG	C1-C2	5.63	1.60	1.52
9	B	701	NAG	C1-C2	5.61	1.60	1.52
9	A	615	NAG	C1-C2	5.60	1.60	1.52
9	E	604	NAG	C1-C2	5.59	1.60	1.52
9	E	610	NAG	C1-C2	5.54	1.59	1.52
9	A	609	NAG	C1-C2	5.52	1.59	1.52
9	A	613	NAG	C1-C2	5.52	1.59	1.52
9	E	608	NAG	C1-C2	5.51	1.59	1.52
9	C	612	NAG	C1-C2	5.43	1.59	1.52
9	E	607	NAG	C1-C2	5.41	1.59	1.52
9	E	605	NAG	C1-C2	5.41	1.59	1.52
9	A	612	NAG	C1-C2	5.32	1.59	1.52
9	C	606	NAG	C1-C2	5.24	1.59	1.52
9	C	605	NAG	C1-C2	5.21	1.59	1.52
9	A	607	NAG	C1-C2	5.21	1.59	1.52
9	A	602	NAG	C1-C2	5.19	1.59	1.52
9	C	607	NAG	C1-C2	5.18	1.59	1.52
9	C	615	NAG	C1-C2	5.14	1.59	1.52
9	E	612	NAG	C1-C2	5.10	1.59	1.52
9	E	611	NAG	C1-C2	5.00	1.59	1.52
9	E	601	NAG	C1-C2	4.99	1.59	1.52
9	C	606	NAG	O5-C5	3.70	1.50	1.43
9	A	610	NAG	O5-C5	3.54	1.50	1.43
9	A	612	NAG	O5-C5	3.47	1.50	1.43
9	E	608	NAG	O5-C5	3.46	1.50	1.43
9	C	605	NAG	O5-C5	3.45	1.50	1.43
9	E	610	NAG	O5-C5	3.43	1.50	1.43
9	E	606	NAG	O5-C5	3.42	1.50	1.43
9	C	615	NAG	O5-C5	3.41	1.50	1.43
9	E	604	NAG	O5-C5	3.40	1.50	1.43
9	A	607	NAG	O5-C5	3.39	1.50	1.43
9	C	607	NAG	O5-C5	3.39	1.50	1.43
9	E	611	NAG	O5-C5	3.34	1.49	1.43
9	C	612	NAG	O5-C5	3.34	1.49	1.43
9	A	615	NAG	O5-C5	3.33	1.49	1.43
9	A	609	NAG	O5-C5	3.33	1.49	1.43
9	E	605	NAG	O5-C5	3.31	1.49	1.43
9	C	609	NAG	O5-C5	3.30	1.49	1.43
9	A	608	NAG	O5-C5	3.28	1.49	1.43
9	A	605	NAG	O5-C5	3.28	1.49	1.43

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	E	609	NAG	O5-C5	3.23	1.49	1.43
9	B	701	NAG	O5-C5	3.21	1.49	1.43
9	A	613	NAG	O5-C5	3.19	1.49	1.43
9	A	604	NAG	O5-C5	3.16	1.49	1.43
9	C	610	NAG	O5-C5	3.15	1.49	1.43
9	F	703	NAG	O5-C5	3.13	1.49	1.43
9	A	611	NAG	O5-C5	3.13	1.49	1.43
9	C	614	NAG	O5-C5	3.12	1.49	1.43
9	C	611	NAG	O5-C5	3.09	1.49	1.43
9	C	608	NAG	O5-C5	3.06	1.49	1.43
9	C	604	NAG	O5-C5	3.05	1.49	1.43
9	E	602	NAG	O5-C5	3.03	1.49	1.43
9	F	702	NAG	O5-C5	3.03	1.49	1.43
9	E	612	NAG	O5-C5	3.02	1.49	1.43
9	E	601	NAG	O5-C5	3.01	1.49	1.43
9	E	607	NAG	O5-C5	3.00	1.49	1.43
9	E	610	NAG	O5-C1	2.97	1.48	1.43
9	C	613	NAG	O5-C5	2.96	1.49	1.43
9	A	602	NAG	O5-C5	2.96	1.49	1.43
9	F	701	NAG	O5-C5	2.93	1.49	1.43
9	A	606	NAG	O5-C5	2.88	1.49	1.43
9	C	605	NAG	O5-C1	2.87	1.48	1.43
9	C	615	NAG	O5-C1	2.87	1.48	1.43
9	C	606	NAG	O5-C1	2.86	1.48	1.43
9	F	702	NAG	C3-C2	2.84	1.58	1.52
9	A	607	NAG	O5-C1	2.84	1.48	1.43
9	C	612	NAG	O5-C1	2.82	1.48	1.43
9	E	604	NAG	O5-C1	2.82	1.48	1.43
9	A	612	NAG	O5-C1	2.73	1.48	1.43
9	C	609	NAG	O5-C1	2.72	1.48	1.43
9	C	607	NAG	O5-C1	2.72	1.48	1.43
9	A	615	NAG	O5-C1	2.71	1.48	1.43
9	A	610	NAG	O5-C1	2.67	1.48	1.43
9	E	608	NAG	O5-C1	2.66	1.48	1.43
9	E	603	NAG	O5-C5	2.66	1.48	1.43
9	E	605	NAG	O5-C1	2.65	1.48	1.43
9	A	605	NAG	O5-C1	2.65	1.48	1.43
9	E	609	NAG	O5-C1	2.64	1.48	1.43
9	C	614	NAG	O5-C1	2.63	1.48	1.43
9	E	602	NAG	O5-C1	2.63	1.48	1.43
9	C	611	NAG	O5-C1	2.61	1.48	1.43
9	A	611	NAG	O5-C1	2.61	1.48	1.43

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	E	603	NAG	C3-C2	2.60	1.58	1.52
9	E	612	NAG	O5-C1	2.59	1.48	1.43
9	A	606	NAG	O5-C1	2.58	1.48	1.43
9	C	608	NAG	O5-C1	2.58	1.48	1.43
9	A	613	NAG	C3-C2	2.57	1.57	1.52
9	F	703	NAG	O5-C1	2.56	1.48	1.43
9	A	609	NAG	O5-C1	2.55	1.48	1.43
9	E	606	NAG	O5-C1	2.53	1.47	1.43
9	A	609	NAG	C4-C5	2.52	1.58	1.53
9	E	611	NAG	O5-C1	2.51	1.47	1.43
9	B	701	NAG	O5-C1	2.46	1.47	1.43
9	A	611	NAG	C3-C2	2.45	1.57	1.52
9	A	608	NAG	O5-C1	2.45	1.47	1.43
9	A	606	NAG	C3-C2	2.44	1.57	1.52
9	E	601	NAG	O5-C1	2.43	1.47	1.43
9	A	608	NAG	C3-C2	2.40	1.57	1.52
9	F	701	NAG	O5-C1	2.40	1.47	1.43
9	C	615	NAG	C3-C2	2.38	1.57	1.52
9	E	609	NAG	C3-C2	2.38	1.57	1.52
9	A	610	NAG	C3-C2	2.37	1.57	1.52
9	E	602	NAG	C4-C5	2.36	1.58	1.53
9	C	610	NAG	O5-C1	2.36	1.47	1.43
9	F	703	NAG	C3-C2	2.36	1.57	1.52
9	C	606	NAG	C4-C5	2.34	1.58	1.53
9	A	604	NAG	O5-C1	2.33	1.47	1.43
9	A	612	NAG	C3-C2	2.33	1.57	1.52
9	A	613	NAG	O5-C1	2.32	1.47	1.43
9	C	610	NAG	C4-C5	2.32	1.58	1.53
9	E	601	NAG	C4-C5	2.32	1.58	1.53
9	C	613	NAG	C3-C2	2.32	1.57	1.52
9	C	615	NAG	C2-N2	2.32	1.50	1.46
9	E	606	NAG	C3-C2	2.31	1.57	1.52
9	E	608	NAG	C3-C2	2.30	1.57	1.52
9	C	606	NAG	C3-C2	2.29	1.57	1.52
9	E	604	NAG	C3-C2	2.29	1.57	1.52
9	A	606	NAG	C4-C5	2.28	1.57	1.53
9	C	613	NAG	O5-C1	2.28	1.47	1.43
9	C	605	NAG	C4-C5	2.28	1.57	1.53
9	C	604	NAG	C3-C2	2.27	1.57	1.52
9	F	701	NAG	C3-C2	2.26	1.57	1.52
9	A	605	NAG	C3-C2	2.25	1.57	1.52
9	C	607	NAG	C2-N2	2.24	1.50	1.46

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	C	609	NAG	C2-N2	2.23	1.50	1.46
9	A	615	NAG	C4-C5	2.23	1.57	1.53
9	A	602	NAG	C4-C5	2.23	1.57	1.53
9	E	612	NAG	C3-C2	2.23	1.57	1.52
9	C	607	NAG	C4-C5	2.22	1.57	1.53
9	F	703	NAG	C4-C5	2.22	1.57	1.53
9	A	615	NAG	C3-C2	2.22	1.57	1.52
9	E	610	NAG	C3-C2	2.22	1.57	1.52
9	C	612	NAG	C3-C2	2.22	1.57	1.52
9	A	604	NAG	C3-C2	2.21	1.57	1.52
9	A	605	NAG	C4-C5	2.21	1.57	1.53
9	C	611	NAG	C3-C2	2.21	1.57	1.52
9	C	614	NAG	C3-C2	2.21	1.57	1.52
9	A	605	NAG	C2-N2	2.20	1.49	1.46
9	E	603	NAG	C4-C5	2.19	1.57	1.53
9	A	607	NAG	C4-C5	2.19	1.57	1.53
9	C	615	NAG	C4-C5	2.19	1.57	1.53
9	A	602	NAG	O5-C1	2.19	1.47	1.43
9	A	607	NAG	C3-C2	2.19	1.57	1.52
9	A	610	NAG	C4-C5	2.18	1.57	1.53
9	C	613	NAG	C4-C5	2.17	1.57	1.53
9	B	701	NAG	C4-C5	2.17	1.57	1.53
9	A	609	NAG	C3-C2	2.16	1.57	1.52
9	C	604	NAG	O5-C1	2.16	1.47	1.43
9	E	608	NAG	C4-C5	2.16	1.57	1.53
9	C	609	NAG	C3-C2	2.15	1.57	1.52
9	C	610	NAG	C3-C2	2.15	1.57	1.52
9	F	702	NAG	C4-C5	2.14	1.57	1.53
9	E	611	NAG	C4-C5	2.14	1.57	1.53
9	C	612	NAG	C4-C5	2.14	1.57	1.53
9	F	701	NAG	C4-C5	2.12	1.57	1.53
9	F	702	NAG	O5-C1	2.12	1.47	1.43
9	E	612	NAG	C4-C5	2.12	1.57	1.53
9	A	613	NAG	C4-C5	2.12	1.57	1.53
9	E	610	NAG	C4-C5	2.11	1.57	1.53
9	E	605	NAG	C4-C5	2.11	1.57	1.53
9	E	605	NAG	C2-N2	2.10	1.49	1.46
9	C	608	NAG	C4-C5	2.10	1.57	1.53
9	E	607	NAG	C4-C5	2.09	1.57	1.53
9	E	601	NAG	C4-C3	2.09	1.57	1.52
9	A	609	NAG	C2-N2	2.09	1.49	1.46
9	B	701	NAG	C3-C2	2.08	1.56	1.52

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	A	611	NAG	C4-C5	2.08	1.57	1.53
9	E	604	NAG	C2-N2	2.08	1.49	1.46
9	F	703	NAG	C2-N2	2.08	1.49	1.46
9	C	608	NAG	C3-C2	2.08	1.56	1.52
9	C	604	NAG	C4-C5	2.07	1.57	1.53
9	E	609	NAG	C4-C5	2.07	1.57	1.53
9	E	603	NAG	O5-C1	2.07	1.47	1.43
9	A	604	NAG	C4-C5	2.07	1.57	1.53
9	E	606	NAG	C4-C5	2.07	1.57	1.53
9	E	602	NAG	C2-N2	2.06	1.49	1.46
9	C	607	NAG	C3-C2	2.06	1.56	1.52
9	C	605	NAG	C3-C2	2.05	1.56	1.52
9	F	701	NAG	C2-N2	2.05	1.49	1.46
9	E	605	NAG	C3-C2	2.05	1.56	1.52
9	E	604	NAG	C4-C5	2.05	1.57	1.53
9	A	612	NAG	C4-C5	2.04	1.57	1.53
9	C	614	NAG	C2-N2	2.04	1.49	1.46
9	C	609	NAG	C4-C5	2.04	1.57	1.53
9	A	602	NAG	C4-C3	2.03	1.57	1.52
9	E	601	NAG	C3-C2	2.02	1.56	1.52
9	A	602	NAG	C3-C2	2.02	1.56	1.52
9	C	610	NAG	C4-C3	2.01	1.57	1.52
9	C	614	NAG	C4-C5	2.01	1.57	1.53
9	E	607	NAG	C4-C3	2.01	1.57	1.52

All (52) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	C	608	NAG	C8-C7-N2	2.88	120.90	116.12
9	E	610	NAG	C8-C7-N2	2.74	120.66	116.12
9	C	607	NAG	C8-C7-N2	2.74	120.65	116.12
9	A	607	NAG	C8-C7-N2	2.70	120.59	116.12
9	A	615	NAG	C1-C2-N2	-2.62	106.30	110.43
9	A	604	NAG	C8-C7-N2	2.60	120.44	116.12
9	E	604	NAG	C8-C7-N2	2.57	120.38	116.12
9	E	607	NAG	C8-C7-N2	2.55	120.35	116.12
9	E	605	NAG	C8-C7-N2	2.52	120.30	116.12
9	C	615	NAG	C8-C7-N2	2.51	120.28	116.12
9	E	606	NAG	C8-C7-N2	2.41	120.12	116.12
9	F	703	NAG	C8-C7-N2	2.38	120.07	116.12
9	E	612	NAG	C8-C7-N2	2.36	120.04	116.12
9	E	601	NAG	O7-C7-C8	-2.35	117.86	122.05

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	A	609	NAG	C8-C7-N2	2.34	120.00	116.12
9	E	603	NAG	C1-O5-C5	2.33	115.31	112.19
9	C	609	NAG	C8-C7-N2	2.30	119.94	116.12
9	E	601	NAG	C8-C7-N2	2.29	119.91	116.12
9	C	606	NAG	C8-C7-N2	2.28	119.90	116.12
9	C	610	NAG	C8-C7-N2	2.28	119.89	116.12
9	A	605	NAG	C8-C7-N2	2.27	119.89	116.12
9	A	612	NAG	C8-C7-N2	2.26	119.86	116.12
9	A	608	NAG	C8-C7-N2	2.25	119.84	116.12
9	A	613	NAG	C1-O5-C5	2.23	115.18	112.19
9	E	612	NAG	C1-C2-N2	-2.23	106.92	110.43
9	A	602	NAG	C1-C2-N2	-2.21	106.95	110.43
9	E	602	NAG	C8-C7-N2	2.20	119.77	116.12
9	C	605	NAG	C8-C7-N2	2.20	119.77	116.12
9	C	604	NAG	C8-C7-N2	2.20	119.76	116.12
9	E	611	NAG	C8-C7-N2	2.20	119.76	116.12
9	A	611	NAG	C1-O5-C5	2.17	115.09	112.19
9	A	607	NAG	O7-C7-C8	-2.15	118.22	122.05
9	A	608	NAG	C1-C2-N2	-2.15	107.05	110.43
9	A	613	NAG	C8-C7-N2	2.13	119.64	116.12
9	E	612	NAG	O7-C7-C8	-2.12	118.28	122.05
9	C	614	NAG	C8-C7-N2	2.12	119.63	116.12
9	A	609	NAG	C1-C2-N2	-2.11	107.11	110.43
9	E	609	NAG	C1-O5-C5	2.10	115.00	112.19
9	A	604	NAG	O7-C7-C8	-2.10	118.31	122.05
9	C	615	NAG	O7-C7-C8	-2.09	118.33	122.05
9	E	603	NAG	C8-C7-N2	2.09	119.58	116.12
9	F	701	NAG	C8-C7-N2	2.08	119.57	116.12
9	C	615	NAG	C1-C2-N2	-2.07	107.18	110.43
9	A	606	NAG	C1-C2-N2	-2.06	107.19	110.43
9	C	613	NAG	C8-C7-N2	2.06	119.53	116.12
9	E	607	NAG	C1-O5-C5	2.05	114.93	112.19
9	E	607	NAG	O7-C7-C8	-2.04	118.42	122.05
9	C	610	NAG	O7-C7-C8	-2.04	118.43	122.05
9	A	606	NAG	C8-C7-N2	2.02	119.46	116.12
9	A	615	NAG	C8-C7-N2	2.02	119.46	116.12
9	F	702	NAG	C1-C2-N2	-2.01	107.26	110.43
9	B	701	NAG	C1-C2-N2	-2.00	107.28	110.43

There are no chirality outliers.

All (36) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	C	601	NAG	C3-C2-N2-C7
9	C	601	NAG	C8-C7-N2-C2
9	C	601	NAG	O7-C7-N2-C2
9	C	602	NAG	C8-C7-N2-C2
9	C	602	NAG	O7-C7-N2-C2
9	A	601	NAG	C8-C7-N2-C2
9	A	601	NAG	O7-C7-N2-C2
9	A	603	NAG	C8-C7-N2-C2
9	A	603	NAG	O7-C7-N2-C2
9	A	614	NAG	C1-C2-N2-C7
9	C	602	NAG	C4-C5-C6-O6
9	C	602	NAG	O5-C5-C6-O6
9	A	614	NAG	O7-C7-N2-C2
9	E	602	NAG	O5-C5-C6-O6
9	A	614	NAG	C8-C7-N2-C2
9	C	603	NAG	C8-C7-N2-C2
9	A	602	NAG	O5-C5-C6-O6
9	C	610	NAG	O5-C5-C6-O6
9	E	602	NAG	C4-C5-C6-O6
9	C	603	NAG	O7-C7-N2-C2
9	A	607	NAG	O5-C5-C6-O6
9	A	610	NAG	O5-C5-C6-O6
9	E	608	NAG	O5-C5-C6-O6
9	C	612	NAG	O5-C5-C6-O6
9	C	605	NAG	O5-C5-C6-O6
9	E	603	NAG	O5-C5-C6-O6
9	C	607	NAG	O5-C5-C6-O6
9	A	606	NAG	O5-C5-C6-O6
9	E	610	NAG	O5-C5-C6-O6
9	E	609	NAG	O5-C5-C6-O6
9	A	602	NAG	C4-C5-C6-O6
9	B	702	NAG	C3-C2-N2-C7
9	F	702	NAG	C4-C5-C6-O6
9	C	610	NAG	C4-C5-C6-O6
9	A	605	NAG	C1-C2-N2-C7
9	B	702	NAG	C1-C2-N2-C7

There are no ring outliers.

1 monomer is involved in 3 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
9	B	702	NAG	3	0

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

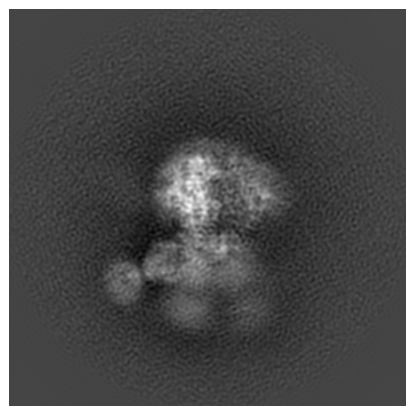
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-23237. These allow visual inspection of the internal detail of the map and identification of artifacts.

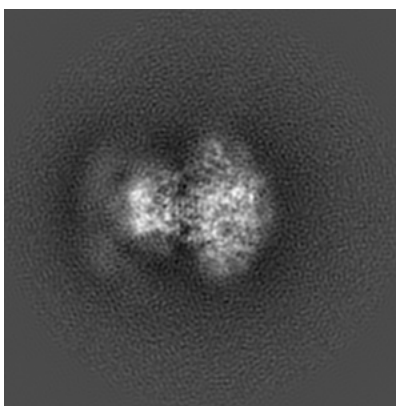
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

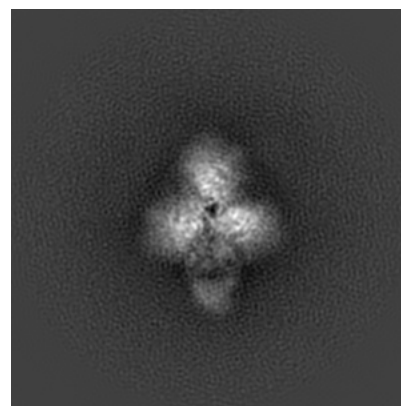
6.1.1 Primary map



X

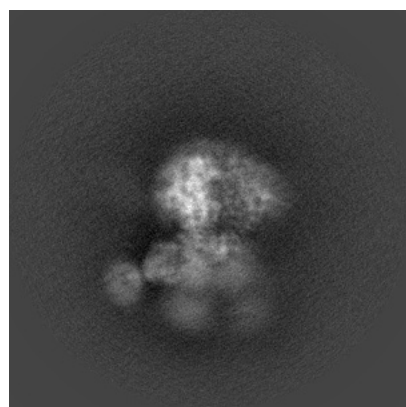


Y

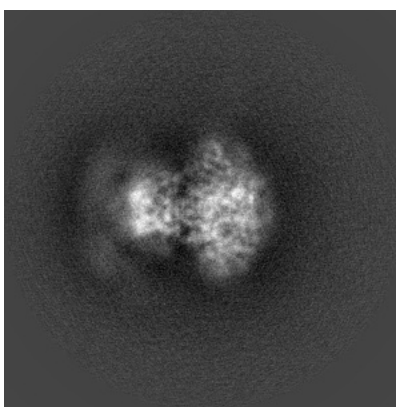


Z

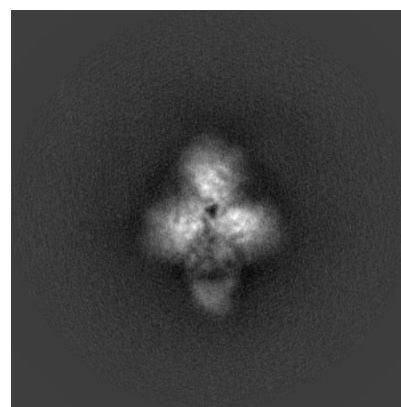
6.1.2 Raw map



X



Y

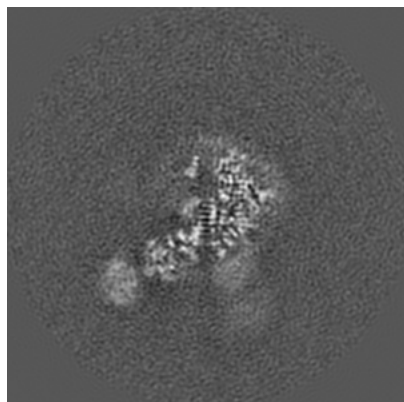


Z

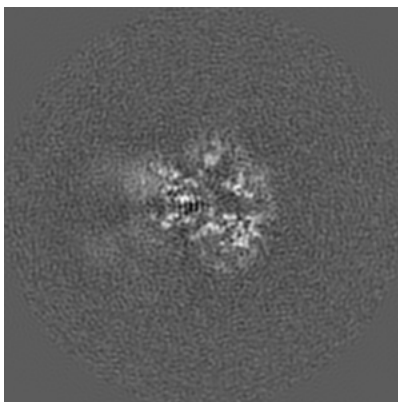
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

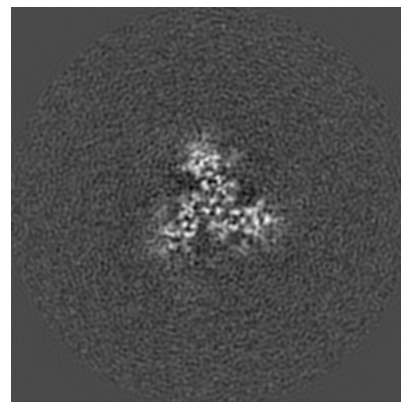
6.2.1 Primary map



X Index: 180

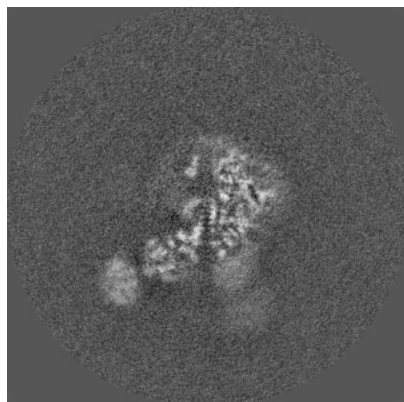


Y Index: 180

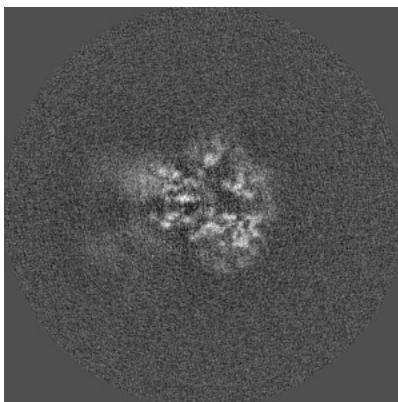


Z Index: 180

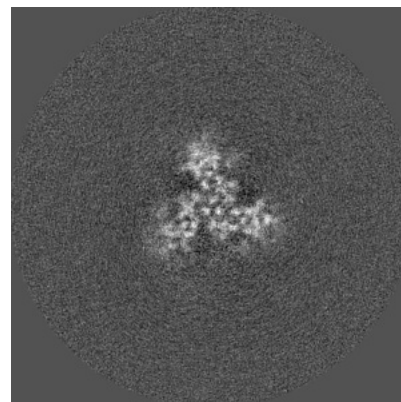
6.2.2 Raw map



X Index: 180



Y Index: 180

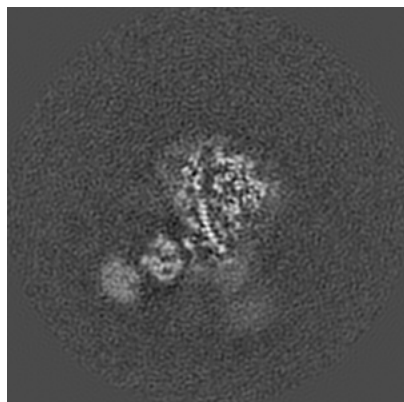


Z Index: 180

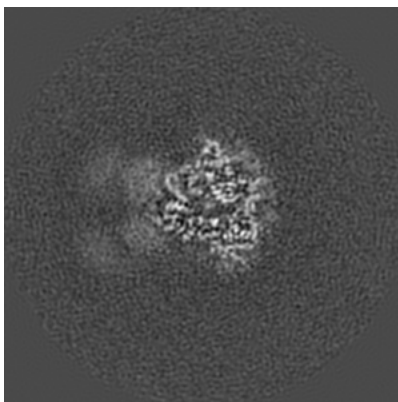
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

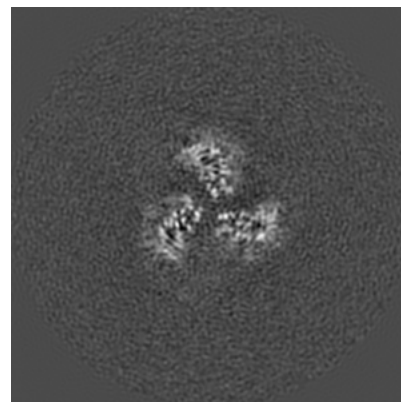
6.3.1 Primary map



X Index: 186

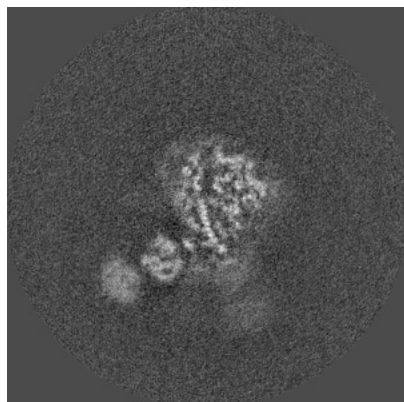


Y Index: 170

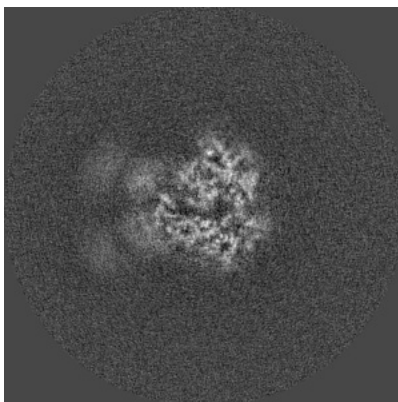


Z Index: 192

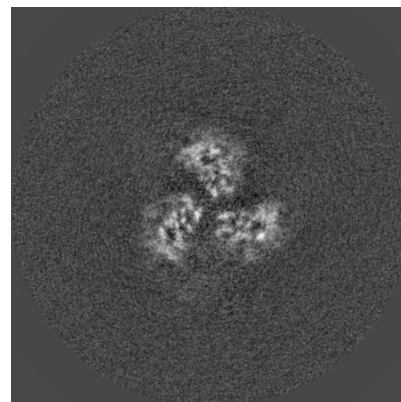
6.3.2 Raw map



X Index: 186



Y Index: 163

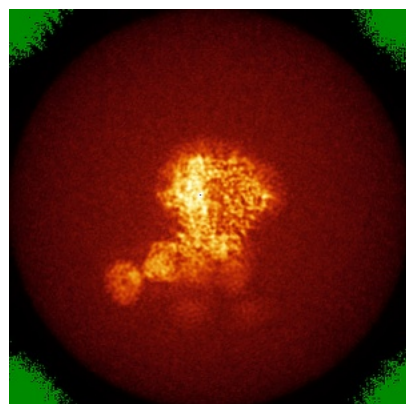


Z Index: 192

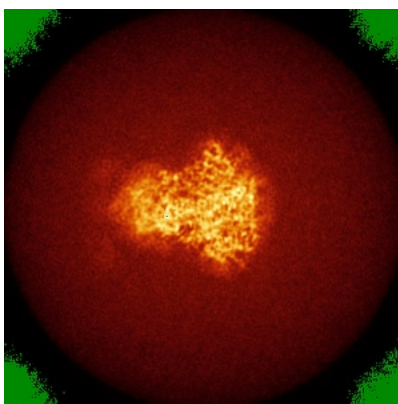
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

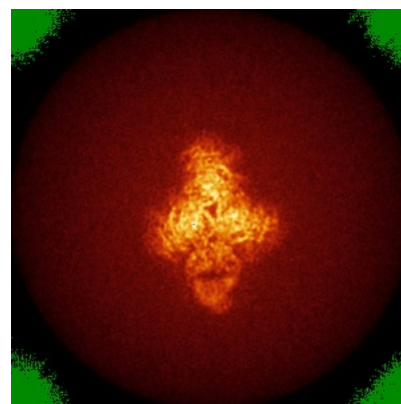
6.4.1 Primary map



X

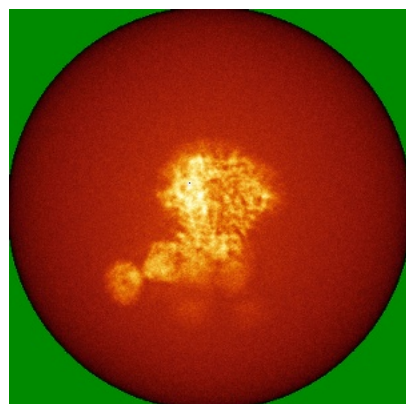


Y

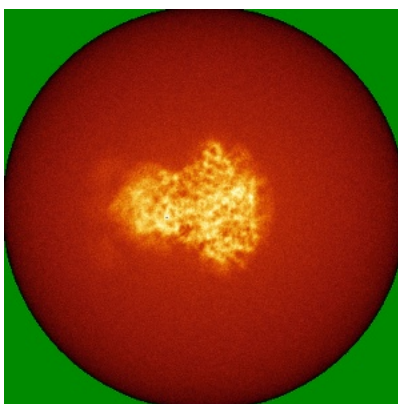


Z

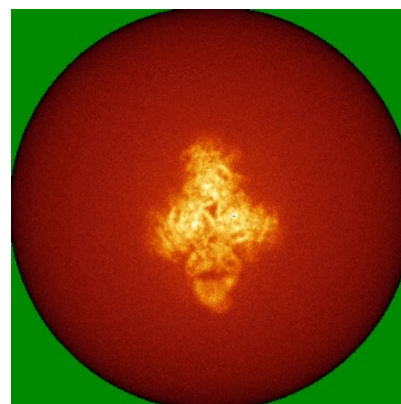
6.4.2 Raw map



X



Y



Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.018. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

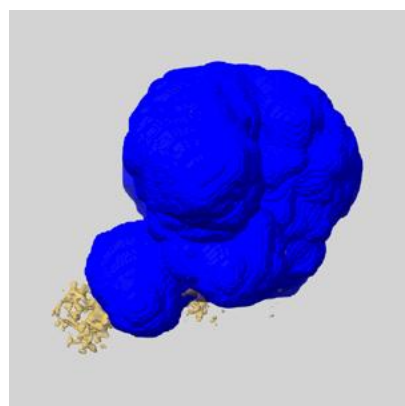
6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

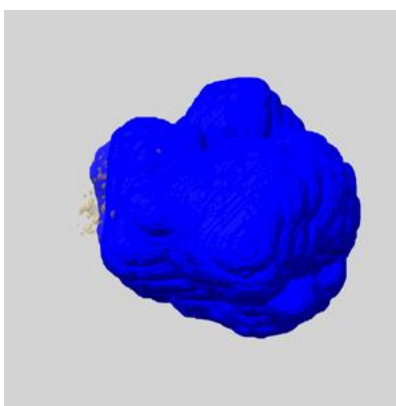
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

6.6.1 emd_23237_msk_1.map [i](#)



X



Y

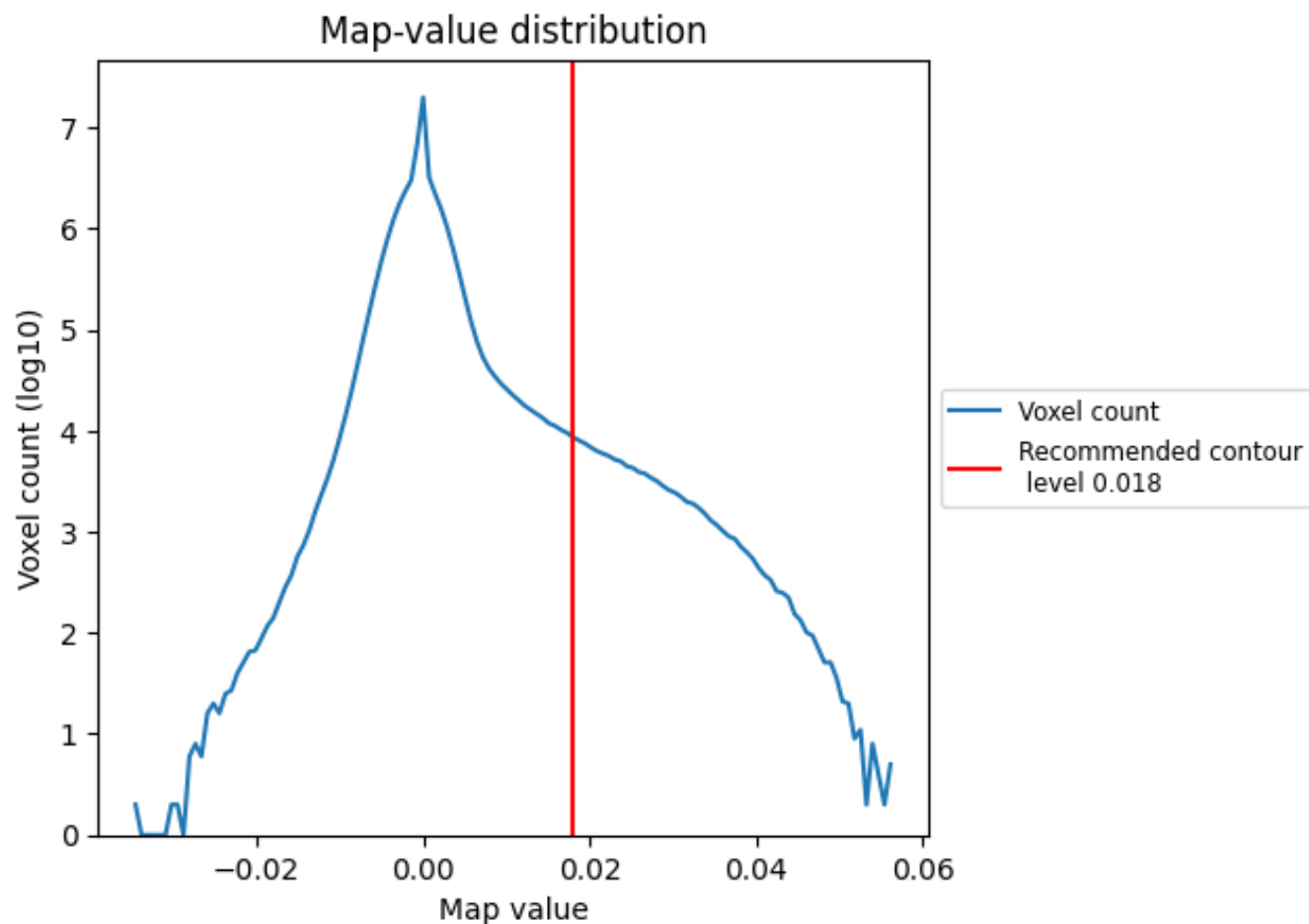


Z

7 Map analysis [i](#)

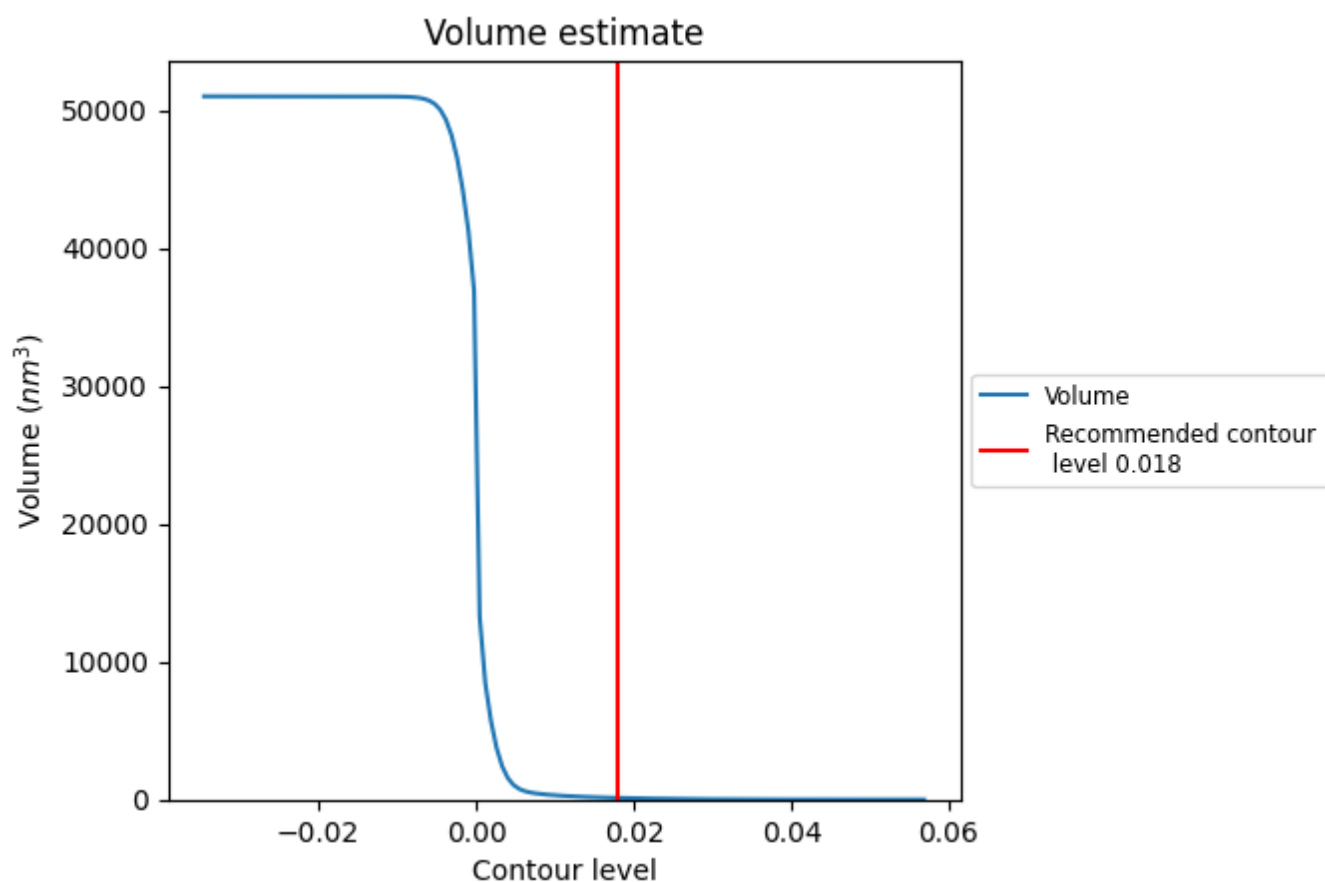
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

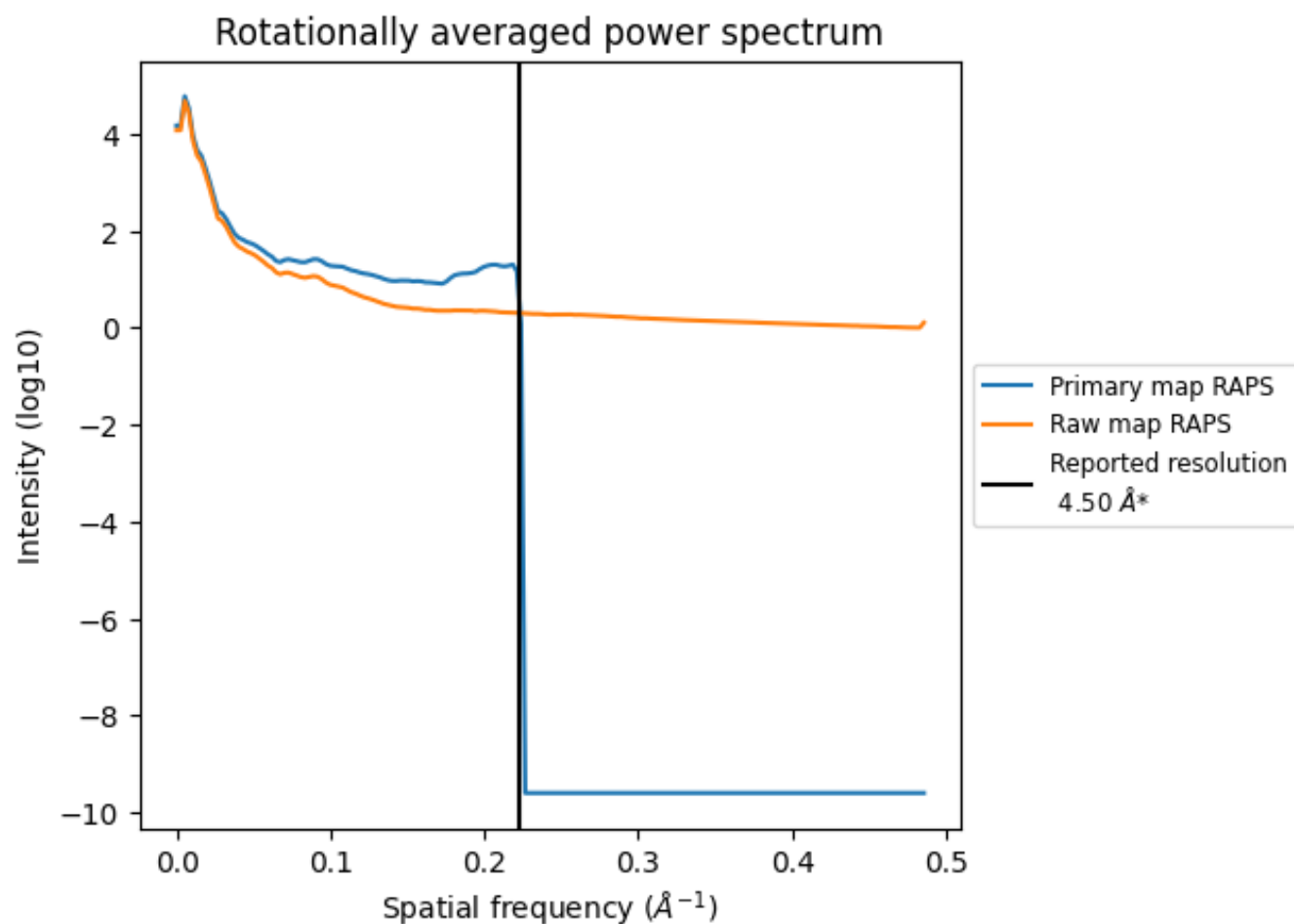
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 119 nm³; this corresponds to an approximate mass of 108 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ

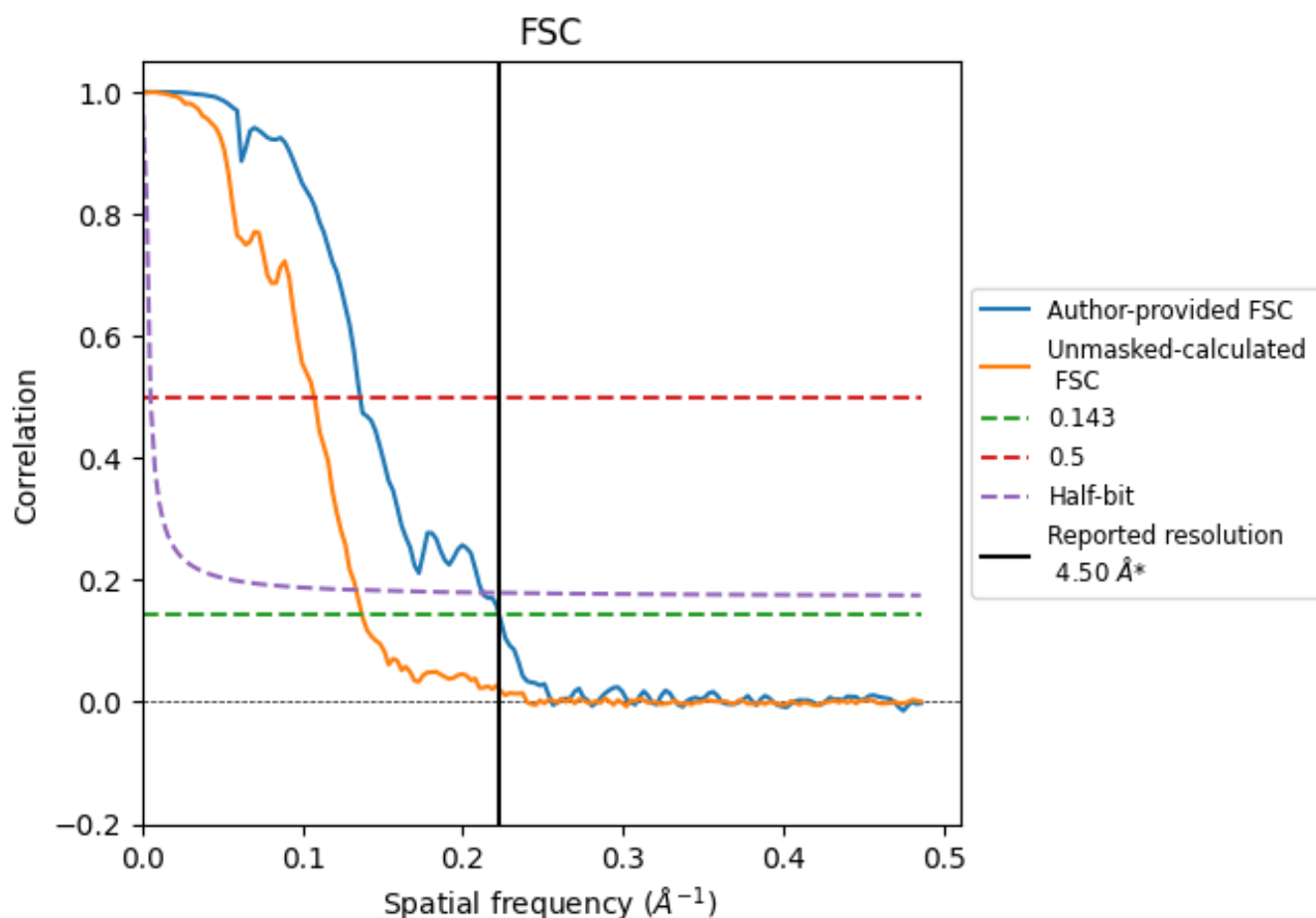


*Reported resolution corresponds to spatial frequency of 0.222 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.222 Å⁻¹

8.2 Resolution estimates [i](#)

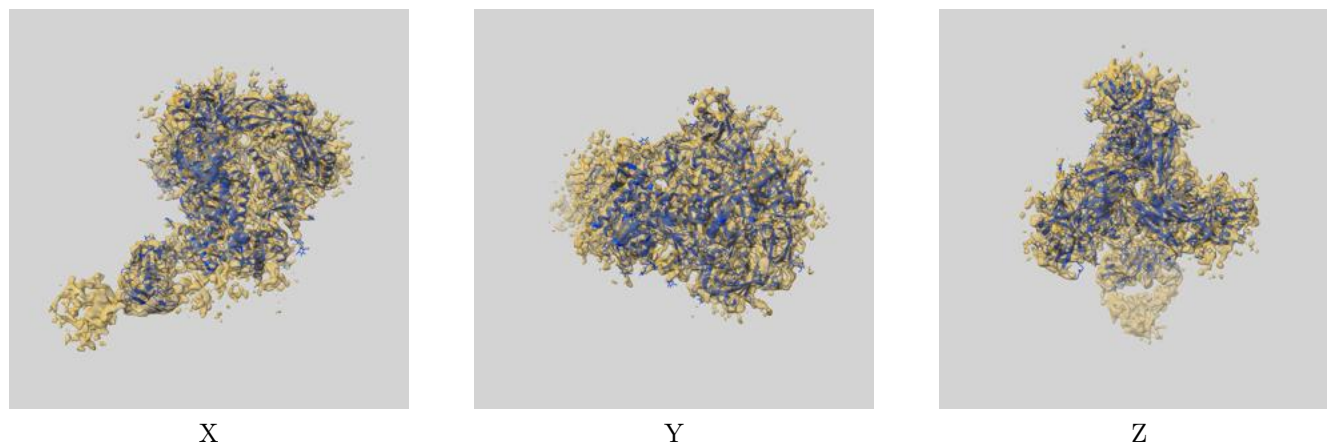
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.50	-	-
Author-provided FSC curve	4.49	7.35	4.71
Unmasked-calculated*	7.29	9.32	7.49

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 7.29 differs from the reported value 4.5 by more than 10 %

9 Map-model fit [i](#)

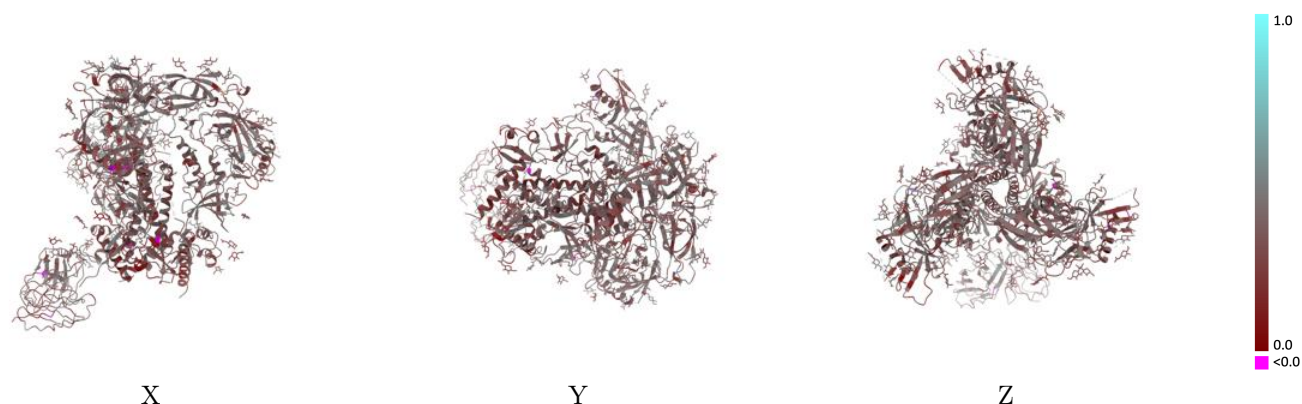
This section contains information regarding the fit between EMDB map EMD-23237 and PDB model 7L8U. Per-residue inclusion information can be found in [section 3](#) on [page 10](#).

9.1 Map-model overlay [i](#)



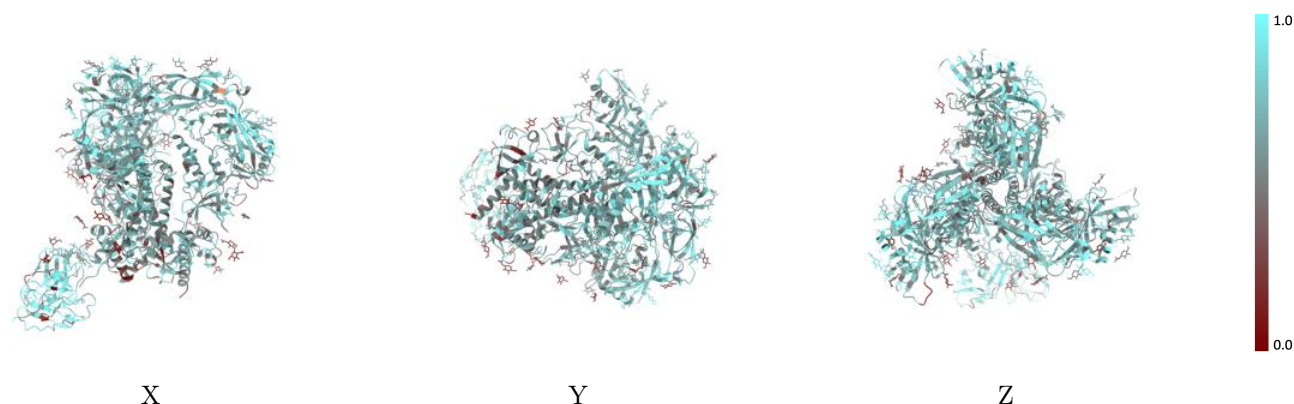
The images above show the 3D surface view of the map at the recommended contour level 0.018 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



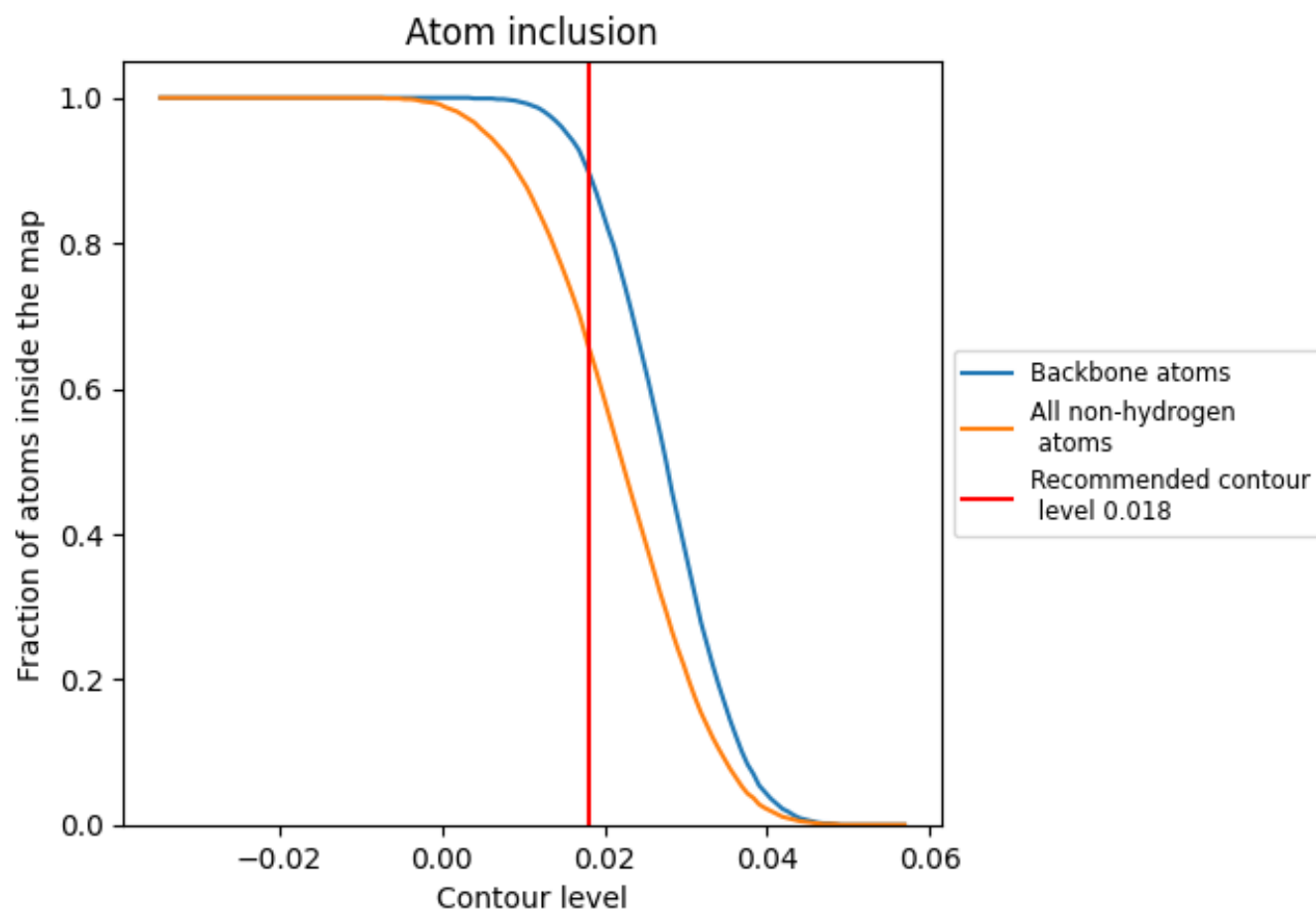
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.018).

9.4 Atom inclusion [i](#)



At the recommended contour level, 90% of all backbone atoms, 66% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.018) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6590	 0.3410
A	 0.6690	 0.3550
B	 0.6100	 0.3310
C	 0.6580	 0.3390
D	 0.5840	 0.2840
E	 0.6820	 0.3560
F	 0.5950	 0.2980
G	 0.7140	 0.3240
H	 0.7860	 0.3700
I	 0.8210	 0.4290
J	 0.5710	 0.3470
K	 0.8570	 0.3990
L	 0.7540	 0.3510
M	 0.5080	 0.3310
N	 0.5000	 0.3270
O	 0.3570	 0.4000
P	 0.5660	 0.3130
Q	 0.1430	 0.2130
R	 0.6790	 0.2720
S	 0.6390	 0.4030
T	 0.5000	 0.3310

