



Full wwPDB EM Validation Report ⓘ

Mar 9, 2026 – 07:09 AM UTC

PDB ID : 6JQO / pdb_00006jqo
EMDB ID : EMD-9876
Title : Structure of PaaZ, a bifunctional enzyme in complex with NADP⁺ and CCoA
Authors : Gakher, L.; Vinothkumar, K.R.; Katagihallimath, N.; Sowdhamini, R.;
Sathyanarayanan, N.; Cannone, G.
Deposited on : 2019-03-31
Resolution : 3.10 Å(reported)

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
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
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

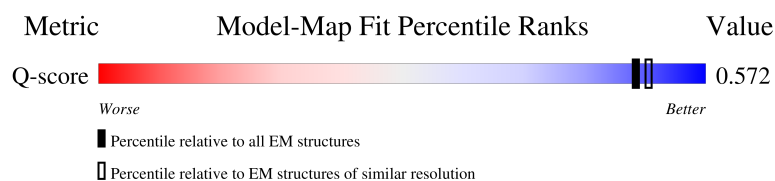
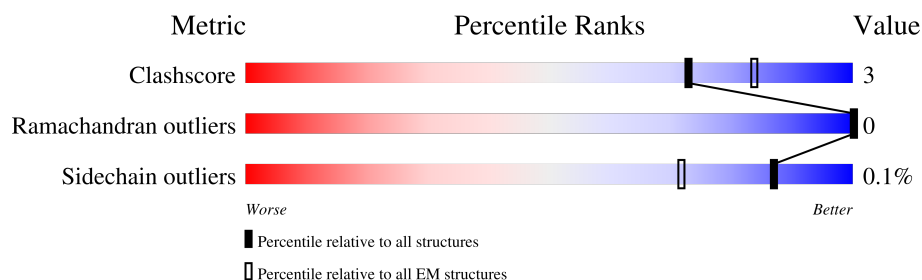
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.10 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	14724 (2.60 - 3.60)

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	688	 89% 9%
1	B	688	 90% 9%
1	C	688	 89% 10%
1	D	688	 89% 9%

Continued on next page...

Continued from previous page...

Mol	Chain	Length	Quality of chain
1	E	688	90% 9%
1	F	688	88% 10%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 31254 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 Bifunctional protein PaaZ.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	678	Total	C	N	O	S	0	0
			5108	3224	904	955	25		
1	B	678	Total	C	N	O	S	0	0
			5108	3224	904	955	25		
1	C	678	Total	C	N	O	S	0	0
			5108	3224	904	955	25		
1	D	678	Total	C	N	O	S	0	0
			5108	3224	904	955	25		
1	E	678	Total	C	N	O	S	0	0
			5108	3224	904	955	25		
1	F	678	Total	C	N	O	S	0	0
			5108	3224	904	955	25		

There are 48 discrepancies between the modelled and reference sequences:

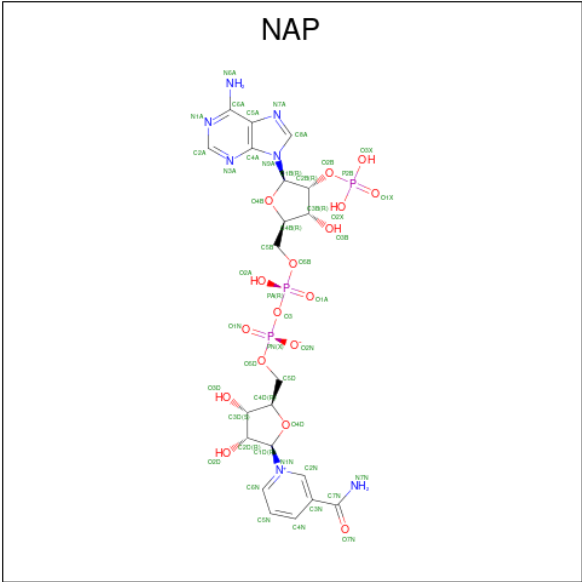
Chain	Residue	Modelled	Actual	Comment	Reference
A	-6	MET	-	initiating methionine	UNP P77455
A	-5	GLY	-	expression tag	UNP P77455
A	-4	HIS	-	expression tag	UNP P77455
A	-3	HIS	-	expression tag	UNP P77455
A	-2	HIS	-	expression tag	UNP P77455
A	-1	HIS	-	expression tag	UNP P77455
A	0	HIS	-	expression tag	UNP P77455
A	1	HIS	-	expression tag	UNP P77455
B	-6	MET	-	initiating methionine	UNP P77455
B	-5	GLY	-	expression tag	UNP P77455
B	-4	HIS	-	expression tag	UNP P77455
B	-3	HIS	-	expression tag	UNP P77455
B	-2	HIS	-	expression tag	UNP P77455
B	-1	HIS	-	expression tag	UNP P77455
B	0	HIS	-	expression tag	UNP P77455
B	1	HIS	-	expression tag	UNP P77455
C	-6	MET	-	initiating methionine	UNP P77455
C	-5	GLY	-	expression tag	UNP P77455

Continued on next page...

Continued from previous page...

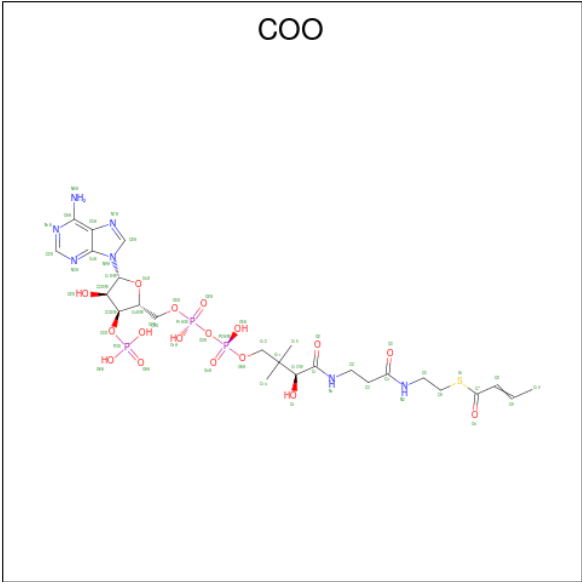
Chain	Residue	Modelled	Actual	Comment	Reference
C	-4	HIS	-	expression tag	UNP P77455
C	-3	HIS	-	expression tag	UNP P77455
C	-2	HIS	-	expression tag	UNP P77455
C	-1	HIS	-	expression tag	UNP P77455
C	0	HIS	-	expression tag	UNP P77455
C	1	HIS	-	expression tag	UNP P77455
D	-6	MET	-	initiating methionine	UNP P77455
D	-5	GLY	-	expression tag	UNP P77455
D	-4	HIS	-	expression tag	UNP P77455
D	-3	HIS	-	expression tag	UNP P77455
D	-2	HIS	-	expression tag	UNP P77455
D	-1	HIS	-	expression tag	UNP P77455
D	0	HIS	-	expression tag	UNP P77455
D	1	HIS	-	expression tag	UNP P77455
E	-6	MET	-	initiating methionine	UNP P77455
E	-5	GLY	-	expression tag	UNP P77455
E	-4	HIS	-	expression tag	UNP P77455
E	-3	HIS	-	expression tag	UNP P77455
E	-2	HIS	-	expression tag	UNP P77455
E	-1	HIS	-	expression tag	UNP P77455
E	0	HIS	-	expression tag	UNP P77455
E	1	HIS	-	expression tag	UNP P77455
F	-6	MET	-	initiating methionine	UNP P77455
F	-5	GLY	-	expression tag	UNP P77455
F	-4	HIS	-	expression tag	UNP P77455
F	-3	HIS	-	expression tag	UNP P77455
F	-2	HIS	-	expression tag	UNP P77455
F	-1	HIS	-	expression tag	UNP P77455
F	0	HIS	-	expression tag	UNP P77455
F	1	HIS	-	expression tag	UNP P77455

- Molecule 2 is NADP NICOTINAMIDE-ADENINE-DINUCLEOTIDE PHOSPHATE (CCD ID: NAP) (formula: $C_{21}H_{28}N_7O_{17}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
2	A	1	Total	C	N	O	P	0
			48	21	7	17	3	
2	B	1	Total	C	N	O	P	0
			48	21	7	17	3	
2	C	1	Total	C	N	O	P	0
			48	21	7	17	3	
2	D	1	Total	C	N	O	P	0
			48	21	7	17	3	
2	E	1	Total	C	N	O	P	0
			48	21	7	17	3	
2	F	1	Total	C	N	O	P	0
			48	21	7	17	3	

- Molecule 3 is CROTONYL COENZYME A (CCD ID: COO) (formula: C₂₅H₄₀N₇O₁₇P₃S) (labeled as "Ligand of Interest" by depositor).

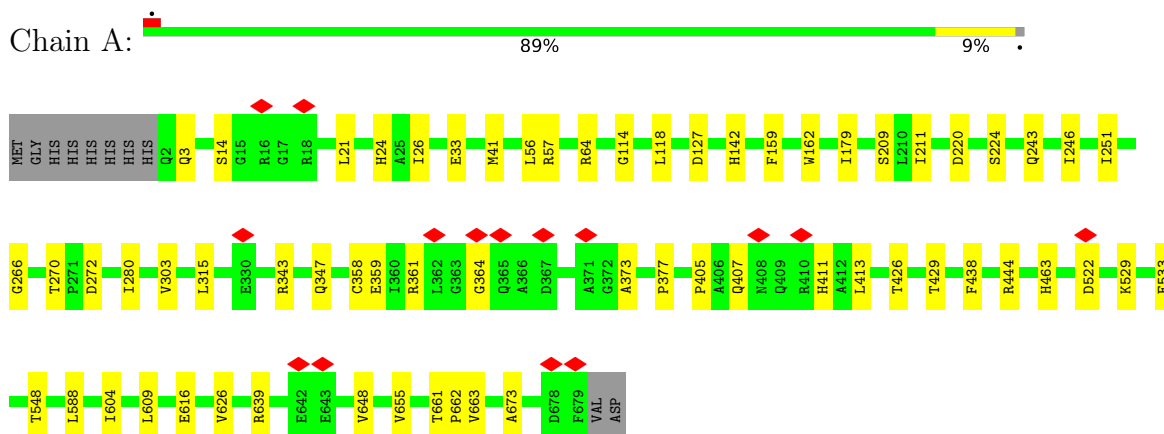


Mol	Chain	Residues	Atoms						AltConf
3	A	1	Total	C	N	O	P	S	0
			53	25	7	17	3	1	
3	B	1	Total	C	N	O	P	S	0
			53	25	7	17	3	1	
3	C	1	Total	C	N	O	P	S	0
			53	25	7	17	3	1	
3	D	1	Total	C	N	O	P	S	0
			53	25	7	17	3	1	
3	E	1	Total	C	N	O	P	S	0
			53	25	7	17	3	1	
3	F	1	Total	C	N	O	P	S	0
			53	25	7	17	3	1	

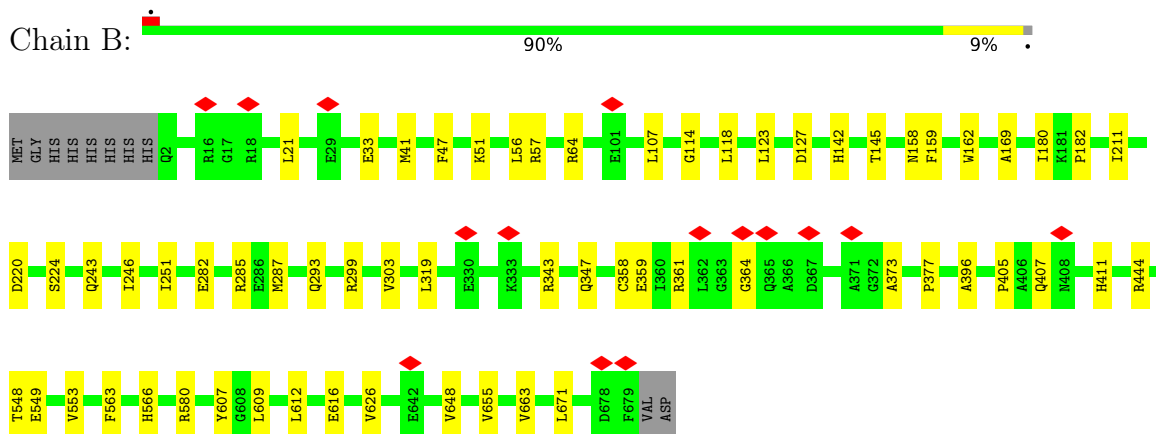
3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

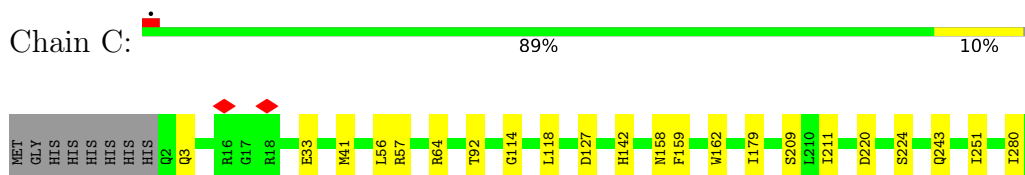
• Molecule 1: Bifunctional protein PaaZ

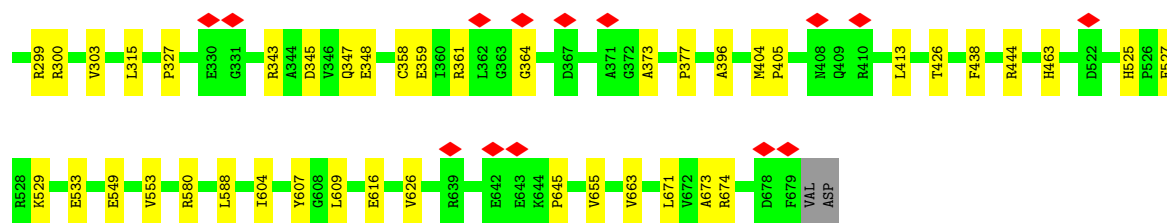


• Molecule 1: Bifunctional protein PaaZ



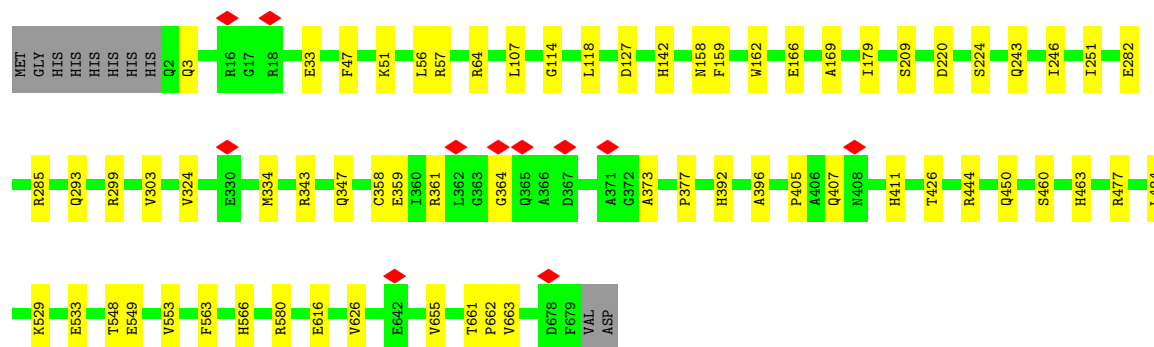
• Molecule 1: Bifunctional protein PaaZ





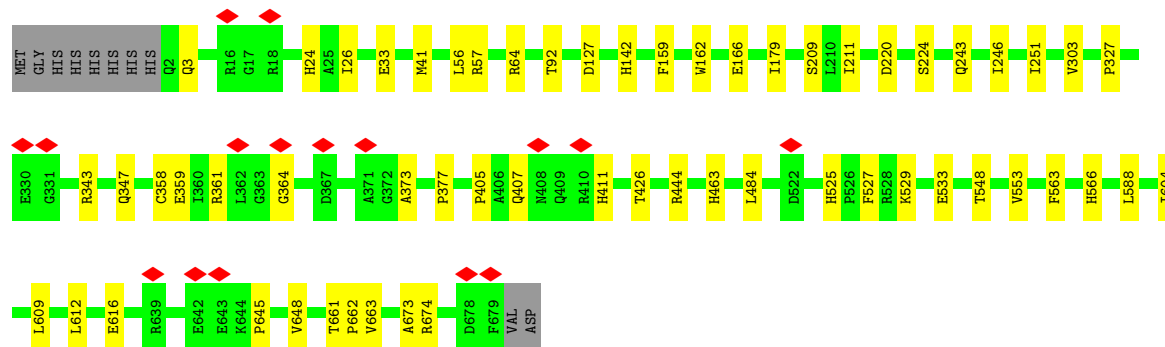
• Molecule 1: Bifunctional protein PaaZ

Chain D: 89% 9% .



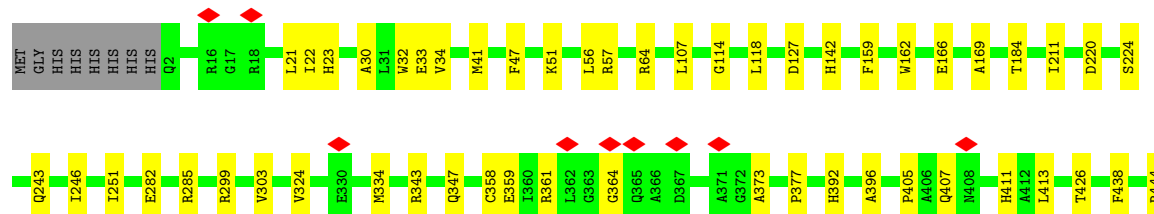
• Molecule 1: Bifunctional protein PaaZ

Chain E: 90% 9% .



• Molecule 1: Bifunctional protein PaaZ

Chain F: 88% 10% .





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C3	Depositor
Number of particles used	120968	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE; CTF was corrected per particle within relion during processing	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	27	Depositor
Minimum defocus (nm)	2200	Depositor
Maximum defocus (nm)	3200	Depositor
Magnification	134615	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.587	Depositor
Minimum map value	-0.308	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.014	Depositor
Recommended contour level	0.085	Depositor
Map size (Å)	428.47998, 428.47998, 428.47998	wwPDB
Map dimensions	412, 412, 412	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.04, 1.04, 1.04	Depositor

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: NAP, COO

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	0.21	0/5211	0.49	0/7073
1	B	0.21	0/5211	0.49	0/7073
1	C	0.21	0/5211	0.49	0/7073
1	D	0.21	0/5211	0.48	0/7073
1	E	0.21	0/5211	0.50	0/7073
1	F	0.21	0/5211	0.48	0/7073
All	All	0.21	0/31266	0.49	0/42438

There are no bond length outliers.

There are no bond angle outliers.

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	5108	0	5122	36	0
1	B	5108	0	5122	35	0
1	C	5108	0	5122	37	0
1	D	5108	0	5122	37	0
1	E	5108	0	5122	35	0
1	F	5108	0	5122	41	0
2	A	48	0	25	0	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	48	0	25	0	0
2	C	48	0	25	0	0
2	D	48	0	25	0	0
2	E	48	0	25	0	0
2	F	48	0	25	0	0
3	A	53	0	37	1	0
3	B	53	0	37	0	0
3	C	53	0	37	0	0
3	D	53	0	37	0	0
3	E	53	0	37	0	0
3	F	53	0	37	0	0
All	All	31254	0	31104	203	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 (203) 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)
1:D:426:THR:HG1	1:D:463:HIS:HD1	1.34	0.71
1:E:361:ARG:HH12	1:E:377:PRO:HB2	1.61	0.66
1:F:616:GLU:HB2	1:F:663:VAL:HG12	1.77	0.65
1:C:361:ARG:HH12	1:C:377:PRO:HB2	1.60	0.65
1:B:114:GLY:HA2	1:B:118:LEU:HD13	1.81	0.62
1:D:114:GLY:HA2	1:D:118:LEU:HD13	1.82	0.61
1:A:361:ARG:HH12	1:A:377:PRO:HB2	1.64	0.61
1:B:616:GLU:HB2	1:B:663:VAL:HG12	1.83	0.60
1:F:114:GLY:HA2	1:F:118:LEU:HD13	1.82	0.59
1:D:127:ASP:OD2	1:D:142:HIS:ND1	2.36	0.57
1:D:616:GLU:HB2	1:D:663:VAL:HG12	1.86	0.57
1:A:616:GLU:HB2	1:A:663:VAL:HG12	1.86	0.57
1:C:114:GLY:HA2	1:C:118:LEU:HD13	1.86	0.57
1:E:616:GLU:HB2	1:E:663:VAL:HG12	1.87	0.56
1:D:224:SER:HA	1:D:251:ILE:HG22	1.86	0.56
1:C:616:GLU:HB2	1:C:663:VAL:HG12	1.87	0.56
1:B:220:ASP:OD1	1:B:243:GLN:NE2	2.39	0.56
1:F:56:LEU:O	1:F:64:ARG:NH1	2.39	0.56
1:C:220:ASP:OD1	1:C:243:GLN:NE2	2.39	0.56
1:E:57:ARG:HD2	1:F:444:ARG:HH22	1.71	0.56
1:E:220:ASP:OD1	1:E:243:GLN:NE2	2.38	0.56
1:F:220:ASP:OD1	1:F:243:GLN:NE2	2.39	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:553:VAL:HG21	1:F:548:THR:HG21	1.87	0.56
1:F:563:PHE:HB3	1:F:566:HIS:HD2	1.72	0.55
1:A:220:ASP:OD1	1:A:243:GLN:NE2	2.40	0.55
1:B:224:SER:HA	1:B:251:ILE:HG22	1.88	0.55
1:E:426:THR:OG1	1:E:463:HIS:ND1	2.39	0.55
1:C:3:GLN:NE2	1:C:33:GLU:OE2	2.40	0.55
1:C:426:THR:OG1	1:C:463:HIS:ND1	2.38	0.55
1:A:426:THR:OG1	1:A:463:HIS:ND1	2.39	0.55
1:C:444:ARG:HH22	1:D:57:ARG:HH11	1.53	0.54
1:D:347:GLN:NE2	1:D:364:GLY:O	2.41	0.54
1:D:626:VAL:HG22	1:D:655:VAL:HG22	1.90	0.54
1:C:127:ASP:OD2	1:C:142:HIS:ND1	2.41	0.54
1:A:347:GLN:NE2	1:A:364:GLY:O	2.41	0.54
1:C:158:ASN:ND2	1:C:293:GLN:O	2.41	0.53
1:E:563:PHE:HB3	1:E:566:HIS:HD2	1.73	0.53
1:B:347:GLN:NE2	1:B:364:GLY:O	2.42	0.53
1:D:299:ARG:NH1	1:D:396:ALA:O	2.42	0.53
1:D:563:PHE:HB3	1:D:566:HIS:HD2	1.74	0.53
1:E:127:ASP:OD2	1:E:142:HIS:ND1	2.42	0.53
1:D:159:PHE:HB3	1:D:162:TRP:HB3	1.91	0.53
1:E:3:GLN:NE2	1:E:33:GLU:OE2	2.41	0.53
1:D:220:ASP:OD1	1:D:243:GLN:NE2	2.40	0.53
1:A:114:GLY:HA2	1:A:118:LEU:HD13	1.89	0.53
1:C:224:SER:HA	1:C:251:ILE:HG22	1.90	0.52
1:A:179:ILE:HG12	1:A:209:SER:HB2	1.91	0.52
1:A:224:SER:HA	1:A:251:ILE:HG22	1.90	0.52
1:E:347:GLN:NE2	1:E:364:GLY:O	2.42	0.52
1:A:56:LEU:O	1:A:64:ARG:NH1	2.43	0.52
1:E:179:ILE:HG12	1:E:209:SER:HB2	1.92	0.52
1:E:56:LEU:O	1:E:64:ARG:NH1	2.43	0.52
1:F:23:HIS:HA	1:F:30:ALA:HA	1.90	0.52
1:F:127:ASP:OD2	1:F:142:HIS:ND1	2.38	0.52
1:D:56:LEU:O	1:D:64:ARG:NH1	2.43	0.51
1:B:548:THR:HG21	1:D:553:VAL:HG21	1.91	0.51
1:D:158:ASN:ND2	1:D:293:GLN:O	2.43	0.51
1:D:361:ARG:HH12	1:D:377:PRO:HB2	1.76	0.51
1:E:645:PRO:HB2	1:E:674:ARG:HB2	1.92	0.51
1:F:41:MET:HE1	1:F:211:ILE:HG21	1.93	0.51
1:B:127:ASP:OD2	1:B:142:HIS:ND1	2.38	0.51
1:C:57:ARG:HH11	1:D:444:ARG:HH22	1.58	0.51
1:D:166:GLU:HB2	1:D:484:LEU:HD21	1.92	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:303:VAL:O	1:C:405:PRO:HA	2.10	0.51
1:A:57:ARG:HD2	1:B:444:ARG:HH22	1.76	0.51
1:E:224:SER:HA	1:E:251:ILE:HG22	1.93	0.51
1:E:303:VAL:O	1:E:405:PRO:HA	2.10	0.51
1:A:522:ASP:OD2	1:A:529:LYS:NZ	2.39	0.51
1:C:56:LEU:O	1:C:64:ARG:NH1	2.43	0.51
1:F:166:GLU:HB2	1:F:484:LEU:HD21	1.93	0.51
1:F:224:SER:HA	1:F:251:ILE:HG22	1.94	0.50
1:C:57:ARG:HD2	1:D:444:ARG:HH22	1.75	0.50
1:F:282:GLU:OE1	1:F:285:ARG:NH2	2.44	0.50
1:B:282:GLU:OE1	1:B:285:ARG:NH2	2.45	0.50
1:C:413:LEU:HD11	1:C:438:PHE:HA	1.93	0.50
1:C:553:VAL:HG21	1:E:548:THR:HG21	1.93	0.50
1:E:246:ILE:HG12	1:E:251:ILE:HD11	1.94	0.49
1:A:246:ILE:HG12	1:A:251:ILE:HD11	1.94	0.49
1:F:47:PHE:O	1:F:51:LYS:HB3	2.11	0.49
1:B:158:ASN:ND2	1:B:293:GLN:O	2.45	0.49
1:F:347:GLN:NE2	1:F:364:GLY:O	2.44	0.49
1:B:299:ARG:NH1	1:B:396:ALA:O	2.45	0.49
1:C:179:ILE:HG12	1:C:209:SER:HB2	1.94	0.49
1:E:159:PHE:HB3	1:E:162:TRP:HB3	1.93	0.49
1:A:41:MET:HE1	1:A:211:ILE:HG21	1.95	0.49
1:A:343:ARG:HH11	1:A:373:ALA:HA	1.77	0.49
1:F:21:LEU:HA	1:F:33:GLU:HA	1.93	0.49
1:B:47:PHE:O	1:B:51:LYS:HB3	2.13	0.49
1:D:548:THR:HG21	1:F:553:VAL:HG21	1.95	0.49
1:F:303:VAL:O	1:F:405:PRO:HA	2.13	0.49
1:F:426:THR:HG1	1:F:463:HIS:HD1	1.56	0.49
1:B:56:LEU:O	1:B:64:ARG:NH1	2.45	0.49
1:C:347:GLN:NE2	1:C:364:GLY:O	2.46	0.48
1:F:22:ILE:HB	1:F:32:TRP:HB2	1.94	0.48
1:D:107:LEU:HD23	1:D:169:ALA:HB2	1.95	0.48
1:D:529:LYS:HB3	1:D:533:GLU:HG3	1.95	0.48
1:B:107:LEU:HD23	1:B:169:ALA:HB2	1.95	0.48
1:B:549:GLU:OE2	1:B:580:ARG:NH1	2.46	0.48
1:E:444:ARG:HH22	1:F:57:ARG:HD2	1.78	0.48
1:F:246:ILE:HG12	1:F:251:ILE:HD11	1.95	0.48
1:D:282:GLU:OE1	1:D:285:ARG:NH2	2.46	0.48
1:F:361:ARG:HH12	1:F:377:PRO:HB2	1.79	0.48
1:A:3:GLN:NE2	1:A:14:SER:OG	2.39	0.48
1:E:41:MET:HE1	1:E:211:ILE:HG21	1.95	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:444:ARG:HH22	1:B:57:ARG:HH11	1.62	0.47
1:D:324:VAL:HG22	1:D:334:MET:HB3	1.96	0.47
1:D:3:GLN:NE2	1:D:33:GLU:OE2	2.47	0.47
1:F:299:ARG:NH1	1:F:396:ALA:O	2.48	0.47
1:B:361:ARG:HH12	1:B:377:PRO:HB2	1.80	0.47
1:D:343:ARG:HH11	1:D:373:ALA:HA	1.80	0.47
1:B:303:VAL:O	1:B:405:PRO:HA	2.14	0.47
1:F:34:VAL:HG21	1:F:184:THR:HB	1.97	0.47
1:B:123:LEU:HG	1:B:145:THR:HG22	1.96	0.46
1:B:358:CYS:SG	1:B:359:GLU:N	2.88	0.46
1:A:57:ARG:HH11	1:B:444:ARG:HH22	1.62	0.46
1:D:246:ILE:HG12	1:D:251:ILE:HD11	1.97	0.46
1:A:548:THR:HG21	1:E:553:VAL:HG21	1.96	0.46
1:A:639:ARG:NH2	3:A:802:COO:O7A	2.47	0.46
1:C:92:THR:HG22	1:C:327:PRO:HB3	1.97	0.46
1:B:609:LEU:HD21	1:B:612:LEU:HB2	1.95	0.46
1:C:159:PHE:HB3	1:C:162:TRP:HB3	1.97	0.46
1:F:343:ARG:HH11	1:F:373:ALA:HA	1.79	0.46
1:D:549:GLU:OE2	1:D:580:ARG:NH1	2.49	0.46
1:A:21:LEU:HA	1:A:33:GLU:HA	1.97	0.46
1:B:159:PHE:HB3	1:B:162:TRP:HB3	1.97	0.46
1:F:450:GLN:NE2	1:F:460:SER:OG	2.48	0.46
1:C:529:LYS:HB3	1:C:533:GLU:HG3	1.98	0.45
1:A:444:ARG:HH22	1:B:57:ARG:HD2	1.80	0.45
1:E:444:ARG:HH22	1:F:57:ARG:HH11	1.64	0.45
1:F:159:PHE:HB3	1:F:162:TRP:HB3	1.96	0.45
1:E:343:ARG:HH11	1:E:373:ALA:HA	1.82	0.45
1:C:343:ARG:HH11	1:C:373:ALA:HA	1.82	0.45
1:C:280:ILE:HG23	1:C:315:LEU:HD23	1.99	0.45
1:C:282:GLU:OE1	1:C:285:ARG:NH2	2.50	0.45
1:C:299:ARG:NH1	1:C:396:ALA:O	2.50	0.45
1:C:588:LEU:HD11	1:C:609:LEU:HD11	1.99	0.45
1:D:407:GLN:H	1:D:411:HIS:HB3	1.82	0.45
1:F:426:THR:OG1	1:F:463:HIS:ND1	2.43	0.45
1:A:604:ILE:HD11	1:A:673:ALA:HB2	1.99	0.45
1:F:529:LYS:HB3	1:F:533:GLU:HG3	1.98	0.45
1:E:92:THR:HG22	1:E:327:PRO:HB3	2.00	0.44
1:B:180:ILE:HG22	1:B:182:PRO:HD3	2.00	0.44
1:B:41:MET:HE1	1:B:211:ILE:HG21	1.98	0.44
1:C:41:MET:HE1	1:C:211:ILE:HG21	1.98	0.44
1:C:358:CYS:SG	1:C:359:GLU:N	2.89	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:413:LEU:HD11	1:A:438:PHE:HA	2.00	0.44
1:E:407:GLN:H	1:E:411:HIS:HB3	1.83	0.44
1:C:549:GLU:OE2	1:C:580:ARG:NH1	2.50	0.44
1:A:270:THR:OG1	1:A:272:ASP:OD1	2.35	0.44
1:A:626:VAL:HG22	1:A:655:VAL:HG22	2.00	0.44
1:A:159:PHE:HB3	1:A:162:TRP:HB3	1.99	0.44
1:C:604:ILE:HD11	1:C:673:ALA:HB2	1.98	0.44
1:E:604:ILE:HD11	1:E:673:ALA:HB2	2.00	0.44
1:A:358:CYS:SG	1:A:359:GLU:N	2.90	0.43
1:E:609:LEU:HD22	1:F:609:LEU:HD22	2.00	0.43
1:A:588:LEU:HD11	1:A:609:LEU:HD11	1.99	0.43
1:C:645:PRO:HB2	1:C:674:ARG:HB2	1.99	0.43
1:D:303:VAL:O	1:D:405:PRO:HA	2.17	0.43
1:B:563:PHE:HB3	1:B:566:HIS:HD2	1.82	0.43
1:E:529:LYS:HB3	1:E:533:GLU:HG3	2.00	0.43
1:F:413:LEU:HD11	1:F:438:PHE:HA	1.99	0.43
1:D:358:CYS:SG	1:D:359:GLU:N	2.90	0.43
1:B:287:MET:HE3	1:B:319:LEU:HD21	2.01	0.43
1:D:47:PHE:O	1:D:51:LYS:HB3	2.19	0.43
1:F:358:CYS:SG	1:F:359:GLU:N	2.89	0.43
1:D:392:HIS:O	1:D:477:ARG:NH1	2.40	0.42
1:E:588:LEU:HD11	1:E:609:LEU:HD11	1.99	0.42
1:E:609:LEU:HD21	1:E:612:LEU:HB2	2.00	0.42
1:A:661:THR:HA	1:A:662:PRO:HD3	1.84	0.42
1:B:343:ARG:HH11	1:B:373:ALA:HA	1.83	0.42
1:F:407:GLN:H	1:F:411:HIS:HB3	1.84	0.42
1:F:107:LEU:HD23	1:F:169:ALA:HB2	2.01	0.42
1:A:407:GLN:H	1:A:411:HIS:HB3	1.83	0.42
1:B:246:ILE:HG12	1:B:251:ILE:HD11	2.00	0.42
1:C:607:TYR:HE1	1:C:671:LEU:HB2	1.84	0.42
1:B:21:LEU:HA	1:B:33:GLU:HA	2.02	0.42
1:F:324:VAL:HG22	1:F:334:MET:HB3	2.02	0.42
1:A:24:HIS:CD2	1:A:26:ILE:HG22	2.55	0.41
1:A:303:VAL:O	1:A:405:PRO:HA	2.20	0.41
1:D:450:GLN:NE2	1:D:460:SER:OG	2.53	0.41
1:E:525:HIS:CD2	1:E:527:PHE:HB2	2.55	0.41
1:F:595:PHE:HB2	1:F:628:LEU:HD22	2.01	0.41
1:B:626:VAL:HG22	1:B:655:VAL:HG22	2.02	0.41
1:C:525:HIS:HD2	1:C:527:PHE:HB2	1.86	0.41
1:E:166:GLU:HB2	1:E:484:LEU:HD21	2.02	0.41
1:A:266:GLY:HA3	1:A:429:THR:HG22	2.03	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:407:GLN:H	1:B:411:HIS:HB3	1.85	0.41
1:A:127:ASP:OD2	1:A:142:HIS:ND1	2.53	0.41
1:E:24:HIS:CE1	1:E:26:ILE:HG22	2.56	0.41
1:E:358:CYS:SG	1:E:359:GLU:N	2.88	0.41
1:D:179:ILE:HG12	1:D:209:SER:HB2	2.02	0.41
1:E:661:THR:HA	1:E:662:PRO:HD3	1.83	0.41
1:A:280:ILE:HG23	1:A:315:LEU:HD23	2.02	0.41
1:B:607:TYR:HE1	1:B:671:LEU:HB2	1.86	0.41
1:C:300:ARG:HB3	1:C:404:MET:HE2	2.03	0.41
1:C:626:VAL:HG22	1:C:655:VAL:HG22	2.02	0.41
1:F:525:HIS:HD2	1:F:526:PRO:HD2	1.86	0.41
1:A:529:LYS:HB3	1:A:533:GLU:HG3	2.02	0.41
1:F:392:HIS:O	1:F:477:ARG:NH1	2.44	0.40
1:D:661:THR:HA	1:D:662:PRO:HD3	1.93	0.40
1:C:345:ASP:HA	1:C:348:GLU:HG2	2.04	0.40
1:E:57:ARG:HH11	1:F:444:ARG:HH22	1.68	0.40
1:C:444:ARG:HH22	1:D:57:ARG:HD2	1.86	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	676/688 (98%)	637 (94%)	39 (6%)	0	100	100
1	B	676/688 (98%)	645 (95%)	31 (5%)	0	100	100
1	C	676/688 (98%)	641 (95%)	35 (5%)	0	100	100
1	D	676/688 (98%)	637 (94%)	39 (6%)	0	100	100
1	E	676/688 (98%)	640 (95%)	36 (5%)	0	100	100
1	F	676/688 (98%)	640 (95%)	36 (5%)	0	100	100
All	All	4056/4128 (98%)	3840 (95%)	216 (5%)	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	529/538 (98%)	528 (100%)	1 (0%)	87	89
1	B	529/538 (98%)	528 (100%)	1 (0%)	87	89
1	C	529/538 (98%)	529 (100%)	0	100	100
1	D	529/538 (98%)	529 (100%)	0	100	100
1	E	529/538 (98%)	528 (100%)	1 (0%)	87	89
1	F	529/538 (98%)	528 (100%)	1 (0%)	87	89
All	All	3174/3228 (98%)	3170 (100%)	4 (0%)	87	90

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	648	VAL
1	B	648	VAL
1	E	648	VAL
1	F	648	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (42) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	3	GLN
1	A	23	HIS
1	A	46	GLN
1	A	351	ASN
1	A	392	HIS
1	A	450	GLN
1	A	525	HIS
1	A	562	HIS
1	B	23	HIS
1	B	46	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	347	GLN
1	B	351	ASN
1	B	392	HIS
1	B	450	GLN
1	B	525	HIS
1	B	659	HIS
1	C	23	HIS
1	C	158	ASN
1	C	351	ASN
1	C	392	HIS
1	C	450	GLN
1	C	525	HIS
1	D	23	HIS
1	D	347	GLN
1	D	351	ASN
1	D	392	HIS
1	D	450	GLN
1	D	566	HIS
1	D	659	HIS
1	E	23	HIS
1	E	351	ASN
1	E	392	HIS
1	E	446	HIS
1	E	450	GLN
1	E	525	HIS
1	F	23	HIS
1	F	351	ASN
1	F	450	GLN
1	F	554	ASN
1	F	562	HIS
1	F	638	GLN
1	F	659	HIS

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 [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

12 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
2	NAP	D	801	-	50,52,52	1.41	7 (14%)	71,80,80	1.53	10 (14%)
3	COO	A	802	-	51,55,55	1.14	4 (7%)	73,81,81	1.55	11 (15%)
2	NAP	F	801	-	50,52,52	1.42	6 (12%)	71,80,80	1.54	9 (12%)
3	COO	B	802	-	51,55,55	1.14	4 (7%)	73,81,81	1.55	10 (13%)
2	NAP	A	801	-	50,52,52	1.42	7 (14%)	71,80,80	1.50	11 (15%)
3	COO	C	802	-	51,55,55	1.14	4 (7%)	73,81,81	1.56	12 (16%)
3	COO	F	802	-	51,55,55	1.16	6 (11%)	73,81,81	1.54	10 (13%)
2	NAP	B	801	-	50,52,52	1.42	7 (14%)	71,80,80	1.54	9 (12%)
3	COO	D	802	-	51,55,55	1.14	4 (7%)	73,81,81	1.56	9 (12%)
3	COO	E	802	-	51,55,55	1.14	4 (7%)	73,81,81	1.56	10 (13%)
2	NAP	E	801	-	50,52,52	1.41	7 (14%)	71,80,80	1.52	9 (12%)
2	NAP	C	801	-	50,52,52	1.42	7 (14%)	71,80,80	1.51	11 (15%)

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
2	NAP	D	801	-	-	7/35/67/67	0/5/5/5
3	COO	A	802	-	-	26/54/70/70	0/3/3/3
2	NAP	F	801	-	-	9/35/67/67	0/5/5/5
3	COO	B	802	-	-	22/54/70/70	0/3/3/3

Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	NAP	A	801	-	-	3/35/67/67	0/5/5/5
3	COO	C	802	-	-	26/54/70/70	0/3/3/3
3	COO	F	802	-	-	22/54/70/70	0/3/3/3
2	NAP	B	801	-	-	8/35/67/67	0/5/5/5
3	COO	D	802	-	-	24/54/70/70	0/3/3/3
3	COO	E	802	-	-	23/54/70/70	0/3/3/3
2	NAP	E	801	-	-	2/35/67/67	0/5/5/5
2	NAP	C	801	-	-	3/35/67/67	0/5/5/5

All (67) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	D	801	NAP	C6N-N1N	4.93	1.46	1.35
2	C	801	NAP	C6N-N1N	4.93	1.46	1.35
2	B	801	NAP	C6N-N1N	4.93	1.46	1.35
2	A	801	NAP	C6N-N1N	4.85	1.46	1.35
2	E	801	NAP	C6N-N1N	4.84	1.46	1.35
3	E	802	COO	C5A-C4A	4.83	1.47	1.39
3	B	802	COO	C5A-C4A	4.82	1.47	1.39
2	F	801	NAP	C6N-N1N	4.81	1.46	1.35
3	A	802	COO	C5A-C4A	4.79	1.47	1.39
3	F	802	COO	C5A-C4A	4.78	1.47	1.39
3	D	802	COO	C5A-C4A	4.76	1.47	1.39
3	C	802	COO	C5A-C4A	4.73	1.47	1.39
2	F	801	NAP	C5A-C4A	4.55	1.47	1.39
2	B	801	NAP	C5A-C4A	4.53	1.47	1.39
2	E	801	NAP	C5A-C4A	4.47	1.47	1.39
2	C	801	NAP	C5A-C4A	4.44	1.47	1.39
2	A	801	NAP	C5A-C4A	4.44	1.47	1.39
2	D	801	NAP	C5A-C4A	4.42	1.47	1.39
2	D	801	NAP	C6N-C5N	3.48	1.45	1.38
2	E	801	NAP	C6N-C5N	3.47	1.45	1.38
2	F	801	NAP	C6N-C5N	3.47	1.45	1.38
2	C	801	NAP	C6N-C5N	3.44	1.45	1.38
2	B	801	NAP	C6N-C5N	3.44	1.45	1.38
2	A	801	NAP	C6N-C5N	3.41	1.45	1.38
3	B	802	COO	C5A-C6A	2.74	1.48	1.41
3	C	802	COO	C5A-C6A	2.73	1.48	1.41
3	A	802	COO	C5A-C6A	2.72	1.48	1.41
3	F	802	COO	C5A-C6A	2.72	1.48	1.41

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	E	802	COO	C5A-C6A	2.70	1.48	1.41
3	D	802	COO	C5A-C6A	2.70	1.48	1.41
2	F	801	NAP	C5A-C6A	2.67	1.48	1.41
2	B	801	NAP	C5A-C6A	2.63	1.48	1.41
2	D	801	NAP	C5A-C6A	2.60	1.48	1.41
2	C	801	NAP	C5A-C6A	2.60	1.48	1.41
2	A	801	NAP	C5A-C6A	2.57	1.48	1.41
2	E	801	NAP	C5A-C6A	2.56	1.48	1.41
3	E	802	COO	C5A-N7A	-2.41	1.34	1.39
3	A	802	COO	C5A-N7A	-2.40	1.34	1.39
2	E	801	NAP	C5A-N7A	-2.38	1.34	1.39
2	D	801	NAP	C5A-N7A	-2.37	1.34	1.39
3	F	802	COO	C5A-N7A	-2.34	1.34	1.39
2	A	801	NAP	C5A-N7A	-2.34	1.34	1.39
3	D	802	COO	C5A-N7A	-2.34	1.34	1.39
3	B	802	COO	C5A-N7A	-2.33	1.34	1.39
3	C	802	COO	C5A-N7A	-2.33	1.34	1.39
2	B	801	NAP	C5A-N7A	-2.32	1.34	1.39
2	C	801	NAP	C5A-N7A	-2.32	1.34	1.39
2	F	801	NAP	C5A-N7A	-2.31	1.34	1.39
3	D	802	COO	C8A-N7A	2.27	1.36	1.31
2	A	801	NAP	C8A-N7A	2.27	1.36	1.31
3	B	802	COO	C8A-N7A	2.26	1.36	1.31
2	F	801	NAP	C8A-N7A	2.26	1.36	1.31
3	C	802	COO	C8A-N7A	2.25	1.36	1.31
3	E	802	COO	C8A-N7A	2.24	1.36	1.31
3	F	802	COO	P2A-O3A	2.23	1.61	1.59
3	A	802	COO	C8A-N7A	2.23	1.36	1.31
3	F	802	COO	C8A-N7A	2.23	1.36	1.31
2	B	801	NAP	C8A-N7A	2.22	1.35	1.31
2	C	801	NAP	C8A-N7A	2.22	1.35	1.31
2	D	801	NAP	C8A-N7A	2.21	1.35	1.31
3	F	802	COO	P1A-O3A	2.21	1.61	1.59
2	E	801	NAP	C8A-N7A	2.18	1.35	1.31
2	A	801	NAP	C4A-N9A	-2.10	1.33	1.37
2	C	801	NAP	C4A-N9A	-2.10	1.33	1.37
2	E	801	NAP	C4A-N9A	-2.10	1.33	1.37
2	D	801	NAP	C4A-N9A	-2.03	1.33	1.37
2	B	801	NAP	C4A-N9A	-2.01	1.33	1.37

All (121) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	802	COO	C5A-C4A-N3A	-6.41	117.89	126.72
3	E	802	COO	C5A-C4A-N3A	-6.40	117.90	126.72
3	D	802	COO	C5A-C4A-N3A	-6.40	117.91	126.72
3	F	802	COO	C5A-C4A-N3A	-6.36	117.97	126.72
3	A	802	COO	C5A-C4A-N3A	-6.31	118.03	126.72
3	C	802	COO	C5A-C4A-N3A	-6.26	118.09	126.72
2	F	801	NAP	C5A-C4A-N3A	-5.72	118.83	126.72
2	B	801	NAP	C5A-C4A-N3A	-5.59	119.02	126.72
2	C	801	NAP	C5A-C4A-N3A	-5.52	119.12	126.72
2	D	801	NAP	C5A-C4A-N3A	-5.49	119.16	126.72
2	E	801	NAP	C5A-C4A-N3A	-5.47	119.19	126.72
2	A	801	NAP	C5A-C4A-N3A	-5.32	119.39	126.72
3	E	802	COO	N3A-C4A-N9A	5.20	136.02	127.17
3	F	802	COO	N3A-C4A-N9A	5.16	135.94	127.17
3	B	802	COO	N3A-C4A-N9A	5.15	135.93	127.17
3	D	802	COO	N3A-C4A-N9A	5.12	135.87	127.17
3	A	802	COO	N3A-C4A-N9A	5.11	135.85	127.17
3	C	802	COO	N3A-C4A-N9A	5.02	135.71	127.17
2	B	801	NAP	C5N-C6N-N1N	-4.65	114.04	120.38
2	D	801	NAP	C5N-C6N-N1N	-4.64	114.06	120.38
2	F	801	NAP	N3A-C4A-N9A	4.52	134.85	127.17
2	C	801	NAP	N3A-C4A-N9A	4.50	134.82	127.17
2	F	801	NAP	C5N-C6N-N1N	-4.47	114.29	120.38
2	E	801	NAP	N3A-C4A-N9A	4.45	134.73	127.17
2	E	801	NAP	C5N-C6N-N1N	-4.43	114.34	120.38
2	B	801	NAP	N3A-C4A-N9A	4.41	134.67	127.17
2	D	801	NAP	N3A-C4A-N9A	4.36	134.58	127.17
2	C	801	NAP	C5N-C6N-N1N	-4.32	114.49	120.38
2	A	801	NAP	C5N-C6N-N1N	-4.28	114.54	120.38
2	A	801	NAP	N3A-C4A-N9A	4.27	134.43	127.17
3	B	802	COO	C2A-N3A-C4A	3.98	121.55	111.83
3	D	802	COO	C2A-N3A-C4A	3.95	121.47	111.83
3	E	802	COO	C2A-N3A-C4A	3.94	121.47	111.83
3	F	802	COO	C2A-N3A-C4A	3.92	121.40	111.83
3	C	802	COO	C2A-N3A-C4A	3.92	121.39	111.83
3	A	802	COO	C2A-N3A-C4A	3.89	121.34	111.83
2	F	801	NAP	C2A-N3A-C4A	3.74	120.98	111.83
2	C	801	NAP	C2A-N3A-C4A	3.66	120.76	111.83
2	D	801	NAP	C2A-N3A-C4A	3.64	120.72	111.83
2	B	801	NAP	C2A-N3A-C4A	3.63	120.71	111.83
2	E	801	NAP	C2A-N3A-C4A	3.63	120.70	111.83
2	A	801	NAP	C2A-N3A-C4A	3.61	120.65	111.83
2	B	801	NAP	C4A-C5A-N7A	-3.50	106.58	110.58

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	801	NAP	C4A-C5A-N7A	-3.48	106.60	110.58
2	A	801	NAP	N3A-C2A-N1A	-3.46	123.34	128.58
2	C	801	NAP	N3A-C2A-N1A	-3.41	123.42	128.58
2	F	801	NAP	N3A-C2A-N1A	-3.41	123.42	128.58
2	E	801	NAP	N3A-C2A-N1A	-3.39	123.45	128.58
2	D	801	NAP	C4A-C5A-N7A	-3.35	106.75	110.58
2	D	801	NAP	N3A-C2A-N1A	-3.35	123.52	128.58
2	B	801	NAP	N3A-C2A-N1A	-3.33	123.53	128.58
3	C	802	COO	N1A-C2A-N3A	-3.33	123.54	128.58
3	C	802	COO	C4A-C5A-N7A	-3.33	106.78	110.58
3	B	802	COO	C4A-C5A-N7A	-3.31	106.79	110.58
3	D	802	COO	C4A-C5A-N7A	-3.31	106.80	110.58
3	E	802	COO	N1A-C2A-N3A	-3.31	123.57	128.58
2	C	801	NAP	C4A-C5A-N7A	-3.31	106.80	110.58
3	B	802	COO	N1A-C2A-N3A	-3.29	123.59	128.58
2	A	801	NAP	C4A-C5A-N7A	-3.28	106.83	110.58
3	A	802	COO	C4A-C5A-N7A	-3.28	106.84	110.58
3	E	802	COO	C4A-C5A-N7A	-3.27	106.85	110.58
3	D	802	COO	N1A-C2A-N3A	-3.27	123.64	128.58
3	A	802	COO	N1A-C2A-N3A	-3.26	123.65	128.58
3	F	802	COO	N1A-C2A-N3A	-3.26	123.65	128.58
2	E	801	NAP	C4A-C5A-N7A	-3.24	106.88	110.58
3	F	802	COO	C4A-C5A-N7A	-3.23	106.89	110.58
2	C	801	NAP	C4A-N9A-C8A	3.05	108.94	105.74
3	D	802	COO	C10-C9-C8	-2.98	119.30	125.28
3	D	802	COO	C3X-C2X-C1X	2.96	106.39	99.89
3	B	802	COO	C3X-C2X-C1X	2.89	106.24	99.89
2	E	801	NAP	C4A-N9A-C8A	2.87	108.75	105.74
2	A	801	NAP	C4A-N9A-C8A	2.87	108.75	105.74
3	A	802	COO	C10-C9-C8	-2.85	119.56	125.28
3	F	802	COO	C3X-C2X-C1X	2.84	106.14	99.89
3	C	802	COO	C10-C9-C8	-2.84	119.57	125.28
3	E	802	COO	C10-C9-C8	-2.81	119.63	125.28
3	F	802	COO	C10-C9-C8	-2.79	119.67	125.28
3	B	802	COO	C10-C9-C8	-2.79	119.67	125.28
2	D	801	NAP	C4A-N9A-C8A	2.73	108.61	105.74
3	C	802	COO	C3X-C2X-C1X	2.73	105.90	99.89
2	B	801	NAP	C4A-N9A-C8A	2.71	108.59	105.74
3	E	802	COO	C3X-C2X-C1X	2.67	105.75	99.89
2	F	801	NAP	C4A-N9A-C8A	2.66	108.53	105.74
3	A	802	COO	C3X-C2X-C1X	2.54	105.47	99.89
2	F	801	NAP	C5A-N7A-C8A	2.52	107.41	103.45

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	801	NAP	C5A-N7A-C8A	2.51	107.39	103.45
3	B	802	COO	C5A-N7A-C8A	2.50	107.37	103.45
3	D	802	COO	C5A-N7A-C8A	2.48	107.34	103.45
2	C	801	NAP	C5A-N7A-C8A	2.47	107.33	103.45
2	D	801	NAP	C5A-N7A-C8A	2.47	107.33	103.45
3	E	802	COO	C5A-N7A-C8A	2.47	107.33	103.45
3	C	802	COO	C5A-N7A-C8A	2.46	107.32	103.45
3	A	802	COO	C5A-N7A-C8A	2.45	107.30	103.45
3	F	802	COO	C5A-N7A-C8A	2.43	107.28	103.45
2	A	801	NAP	C5A-N7A-C8A	2.40	107.22	103.45
3	A	802	COO	C4A-N9A-C8A	2.39	108.24	105.74
3	C	802	COO	C4A-N9A-C8A	2.39	108.24	105.74
3	F	802	COO	O4X-C1X-N9A	2.38	112.66	108.09
3	A	802	COO	O4X-C1X-N9A	2.38	112.65	108.09
2	E	801	NAP	C5A-N7A-C8A	2.37	107.18	103.45
3	E	802	COO	C4A-N9A-C8A	2.35	108.20	105.74
3	F	802	COO	C4A-N9A-C8A	2.30	108.16	105.74
3	D	802	COO	C4A-N9A-C8A	2.30	108.15	105.74
3	E	802	COO	O4X-C1X-N9A	2.29	112.48	108.09
3	B	802	COO	C4A-N9A-C8A	2.28	108.13	105.74
3	C	802	COO	O4X-C1X-N9A	2.21	112.34	108.09
2	B	801	NAP	C6A-C5A-N7A	2.21	136.35	132.09
2	F	801	NAP	C6A-C5A-N7A	2.19	136.31	132.09
2	A	801	NAP	C6A-C5A-N7A	2.19	136.31	132.09
2	D	801	NAP	C6A-C5A-N7A	2.17	136.27	132.09
2	C	801	NAP	N9A-C8A-N7A	-2.16	110.88	113.94
2	C	801	NAP	C6A-C5A-N7A	2.14	136.21	132.09
2	E	801	NAP	C6A-C5A-N7A	2.11	136.16	132.09
2	A	801	NAP	N9A-C8A-N7A	-2.06	111.01	113.94
3	C	802	COO	C14-C11-C13	2.06	112.27	108.77
3	A	802	COO	C2-C3-C4	-2.05	108.98	112.39
3	C	802	COO	C2-C3-C4	-2.03	109.01	112.39
2	D	801	NAP	N9A-C8A-N7A	-2.03	111.06	113.94
2	C	801	NAP	C2N-C3N-C4N	2.02	120.61	118.26
2	A	801	NAP	C2A-N1A-C6A	2.02	122.05	118.73
3	B	802	COO	O4X-C1X-N9A	2.01	111.95	108.09

There are no chirality outliers.

All (175) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	801	NAP	C5B-O5B-PA-O1A

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
2	A	801	NAP	C5B-O5B-PA-O3
2	B	801	NAP	C5B-O5B-PA-O1A
2	B	801	NAP	C5B-O5B-PA-O2A
2	B	801	NAP	C5B-O5B-PA-O3
2	B	801	NAP	C5D-O5D-PN-O3
2	B	801	NAP	C5D-O5D-PN-O2N
2	C	801	NAP	C5B-O5B-PA-O1A
2	D	801	NAP	C5B-O5B-PA-O2A
2	E	801	NAP	C5B-O5B-PA-O1A
2	F	801	NAP	C5B-O5B-PA-O1A
2	F	801	NAP	C5B-O5B-PA-O2A
2	F	801	NAP	C5B-O5B-PA-O3
3	A	802	COO	C14-C11-C13-O1
3	A	802	COO	C12-C11-C13-O1
3	A	802	COO	C14-C11-C13-C1
3	A	802	COO	C12-C11-C13-C1
3	A	802	COO	C13-C11-C12-O6A
3	A	802	COO	C14-C11-C12-O6A
3	A	802	COO	C15-C11-C12-O6A
3	A	802	COO	C5X-O5X-P1A-O3A
3	A	802	COO	C5X-O5X-P1A-O2A
3	A	802	COO	O4X-C4X-C5X-O5X
3	A	802	COO	C3X-C4X-C5X-O5X
3	A	802	COO	O4X-C1X-N9A-C8A
3	A	802	COO	O4X-C1X-N9A-C4A
3	B	802	COO	C14-C11-C13-O1
3	B	802	COO	C12-C11-C13-O1
3	B	802	COO	C14-C11-C13-C1
3	B	802	COO	C12-C11-C13-C1
3	B	802	COO	C15-C11-C13-C1
3	B	802	COO	C13-C11-C12-O6A
3	B	802	COO	C14-C11-C12-O6A
3	B	802	COO	C15-C11-C12-O6A
3	B	802	COO	C11-C12-O6A-P2A
3	B	802	COO	O4X-C1X-N9A-C8A
3	B	802	COO	O4X-C1X-N9A-C4A
3	C	802	COO	C14-C11-C13-O1
3	C	802	COO	C12-C11-C13-O1
3	C	802	COO	C14-C11-C13-C1
3	C	802	COO	C12-C11-C13-C1
3	C	802	COO	C15-C11-C13-C1
3	C	802	COO	C13-C11-C12-O6A

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
3	C	802	COO	C14-C11-C12-O6A
3	C	802	COO	C15-C11-C12-O6A
3	C	802	COO	C5X-O5X-P1A-O3A
3	C	802	COO	C5X-O5X-P1A-O2A
3	C	802	COO	O4X-C4X-C5X-O5X
3	C	802	COO	O4X-C1X-N9A-C8A
3	C	802	COO	O4X-C1X-N9A-C4A
3	D	802	COO	C14-C11-C13-O1
3	D	802	COO	C12-C11-C13-O1
3	D	802	COO	C14-C11-C13-C1
3	D	802	COO	C12-C11-C13-C1
3	D	802	COO	C15-C11-C13-C1
3	D	802	COO	C13-C11-C12-O6A
3	D	802	COO	C14-C11-C12-O6A
3	D	802	COO	C15-C11-C12-O6A
3	D	802	COO	C11-C12-O6A-P2A
3	D	802	COO	O4X-C1X-N9A-C8A
3	D	802	COO	O4X-C1X-N9A-C4A
3	D	802	COO	O4-C7-S1-C6
3	D	802	COO	S1-C7-C8-C9
3	E	802	COO	C14-C11-C13-O1
3	E	802	COO	C12-C11-C13-O1
3	E	802	COO	C14-C11-C13-C1
3	E	802	COO	C12-C11-C13-C1
3	E	802	COO	C15-C11-C13-C1
3	E	802	COO	C13-C11-C12-O6A
3	E	802	COO	C14-C11-C12-O6A
3	E	802	COO	C15-C11-C12-O6A
3	E	802	COO	C11-C12-O6A-P2A
3	E	802	COO	O4X-C4X-C5X-O5X
3	E	802	COO	O4X-C1X-N9A-C8A
3	E	802	COO	O4X-C1X-N9A-C4A
3	F	802	COO	C14-C11-C13-O1
3	F	802	COO	C12-C11-C13-O1
3	F	802	COO	C14-C11-C13-C1
3	F	802	COO	C12-C11-C13-C1
3	F	802	COO	C13-C11-C12-O6A
3	F	802	COO	C14-C11-C12-O6A
3	F	802	COO	C15-C11-C12-O6A
3	F	802	COO	C11-C12-O6A-P2A
3	F	802	COO	O4X-C4X-C5X-O5X
3	F	802	COO	C3X-C4X-C5X-O5X

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
3	F	802	COO	O4X-C1X-N9A-C8A
3	F	802	COO	O4X-C1X-N9A-C4A
3	C	802	COO	C3X-C4X-C5X-O5X
3	E	802	COO	C3X-C4X-C5X-O5X
3	D	802	COO	O4X-C4X-C5X-O5X
3	A	802	COO	C4X-C3X-O3X-P3X
3	A	802	COO	C2X-C3X-O3X-P3X
3	C	802	COO	C4X-C3X-O3X-P3X
3	E	802	COO	C4X-C3X-O3X-P3X
3	F	802	COO	C4X-C3X-O3X-P3X
3	D	802	COO	C3X-C4X-C5X-O5X
3	B	802	COO	C3X-C4X-C5X-O5X
3	C	802	COO	C2X-C3X-O3X-P3X
3	E	802	COO	C2X-C3X-O3X-P3X
3	F	802	COO	C2X-C3X-O3X-P3X
3	B	802	COO	O4X-C4X-C5X-O5X
3	A	802	COO	C15-C11-C13-O1
3	B	802	COO	C15-C11-C13-O1
3	C	802	COO	C15-C11-C13-O1
3	D	802	COO	C15-C11-C13-O1
3	E	802	COO	C15-C11-C13-O1
3	F	802	COO	C15-C11-C13-O1
3	D	802	COO	O2-C1-C13-C11
3	E	802	COO	O2-C1-C13-C11
3	F	802	COO	O2-C1-C13-C11
3	D	802	COO	N1-C1-C13-O1
3	E	802	COO	N1-C1-C13-O1
3	F	802	COO	N1-C1-C13-O1
3	A	802	COO	C2-C3-C4-O3
3	B	802	COO	C2-C3-C4-O3
3	D	802	COO	C2-C3-C4-O3
3	E	802	COO	C2-C3-C4-O3
3	F	802	COO	C2-C3-C4-O3
2	A	801	NAP	C4D-C5D-O5D-PN
2	C	801	NAP	C4D-C5D-O5D-PN
3	D	802	COO	C8-C7-S1-C6
3	A	802	COO	C15-C11-C13-C1
3	F	802	COO	C15-C11-C13-C1
2	B	801	NAP	PN-O3-PA-O2A
2	D	801	NAP	PN-O3-PA-O2A
3	A	802	COO	C11-C12-O6A-P2A
3	E	802	COO	O4-C7-S1-C6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms
3	B	802	COO	C4X-C5X-O5X-P1A
3	C	802	COO	C4X-C5X-O5X-P1A
2	B	801	NAP	C5D-O5D-PN-O1N
2	D	801	NAP	C5B-O5B-PA-O1A
2	D	801	NAP	C5B-O5B-PA-O3
2	D	801	NAP	C5D-O5D-PN-O3
2	D	801	NAP	C5D-O5D-PN-O1N
2	F	801	NAP	C5D-O5D-PN-O3
2	F	801	NAP	C5D-O5D-PN-O1N
2	F	801	NAP	C5D-O5D-PN-O2N
3	A	802	COO	C5X-O5X-P1A-O1A
3	C	802	COO	C5X-O5X-P1A-O1A
3	C	802	COO	C2-C3-C4-O3
2	B	801	NAP	C4D-C5D-O5D-PN
2	E	801	NAP	C4D-C5D-O5D-PN
2	F	801	NAP	C4D-C5D-O5D-PN
3	A	802	COO	C4X-C5X-O5X-P1A
3	D	802	COO	C4X-C5X-O5X-P1A
3	E	802	COO	C4X-C5X-O5X-P1A
2	D	801	NAP	C4D-C5D-O5D-PN
2	F	801	NAP	PN-O3-PA-O2A
3	B	802	COO	C4X-C3X-O3X-P3X
3	B	802	COO	C2-C3-C4-N2
3	E	802	COO	C2-C3-C4-N2
3	F	802	COO	C2-C3-C4-N2
3	A	802	COO	N1-C1-C13-O1
3	B	802	COO	N1-C1-C13-O1
3	C	802	COO	N1-C1-C13-O1
3	A	802	COO	C2-C3-C4-N2
3	C	802	COO	C2-C3-C4-N2
3	D	802	COO	C2-C3-C4-N2
3	D	802	COO	C4X-C3X-O3X-P3X
3	A	802	COO	O2-C1-C13-C11
3	B	802	COO	O2-C1-C13-C11
3	C	802	COO	O2-C1-C13-C11
2	C	801	NAP	C2B-O2B-P2B-O3X
3	A	802	COO	C3X-O3X-P3X-O7A
3	C	802	COO	C11-C12-O6A-P2A
3	B	802	COO	C2X-C3X-O3X-P3X
3	C	802	COO	O4-C7-S1-C6
3	F	802	COO	O4-C7-S1-C6
3	A	802	COO	N1-C1-C13-C11

Continued on next page...

Continued from previous page...

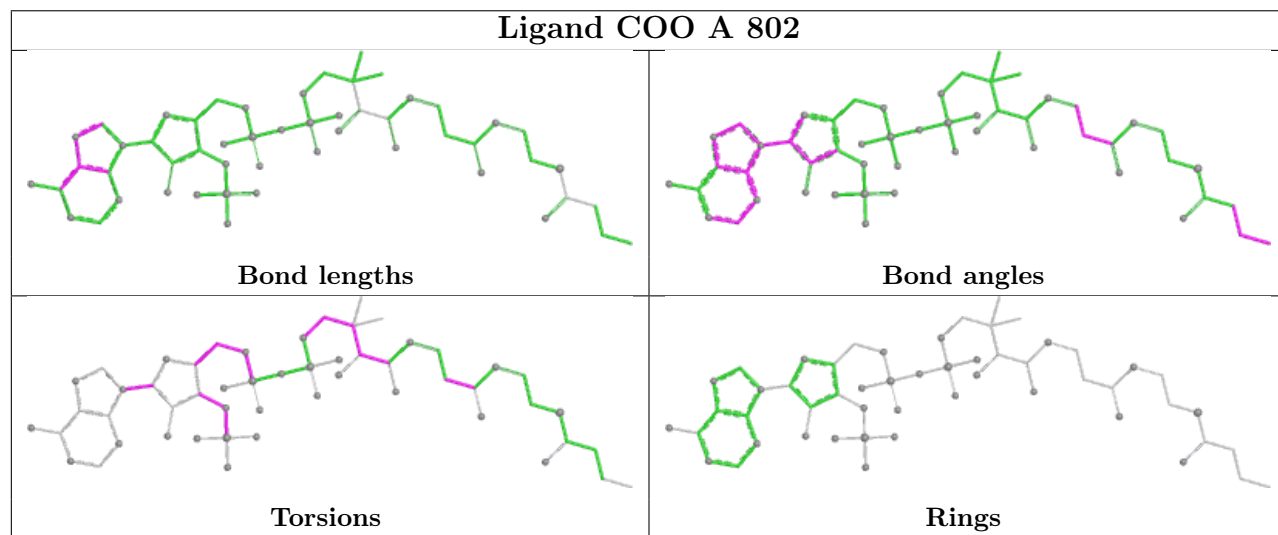
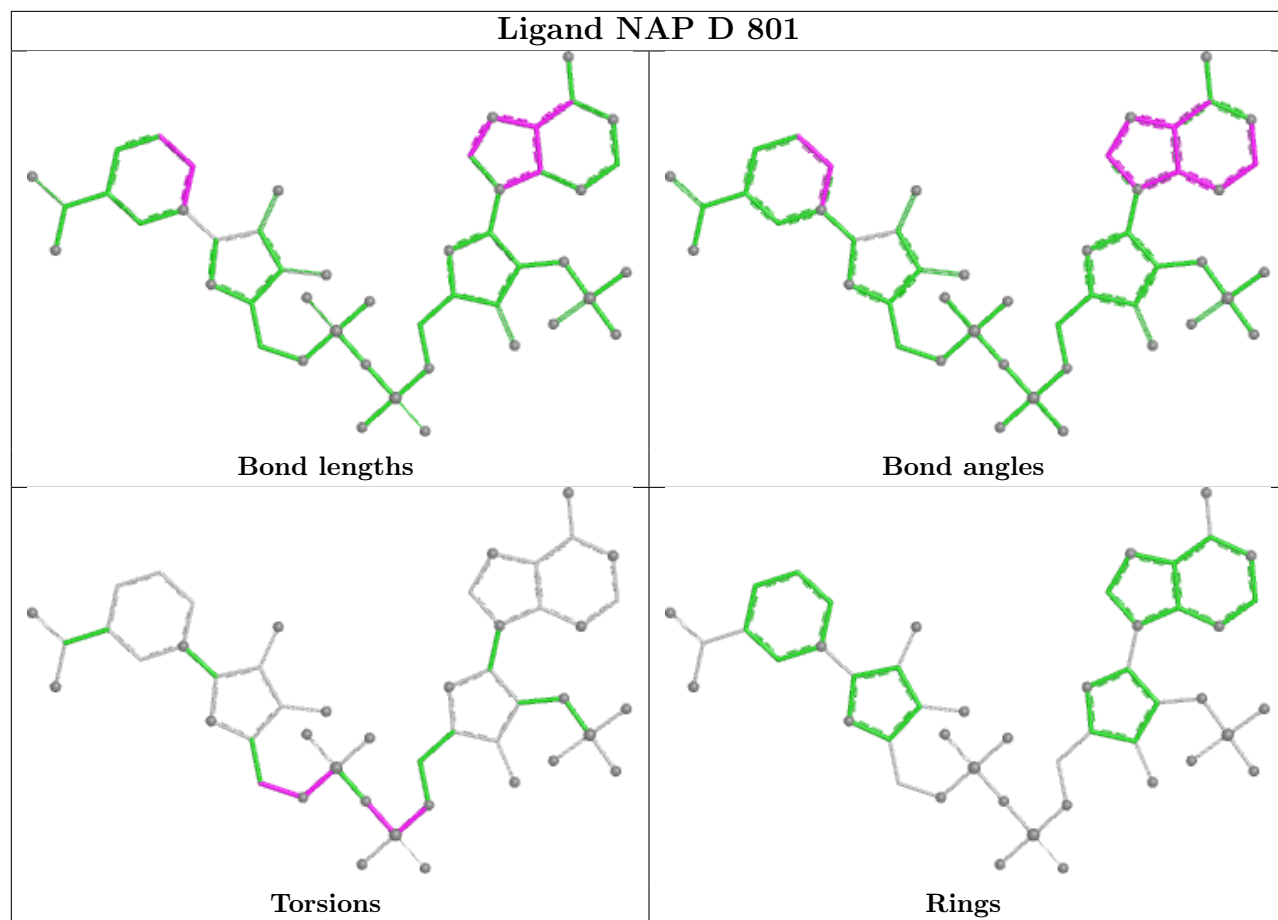
Mol	Chain	Res	Type	Atoms
3	B	802	COO	N1-C1-C13-C11
3	C	802	COO	N1-C1-C13-C11
3	D	802	COO	N1-C1-C13-C11
3	E	802	COO	N1-C1-C13-C11
3	F	802	COO	N1-C1-C13-C11
2	F	801	NAP	PN-O3-PA-O1A

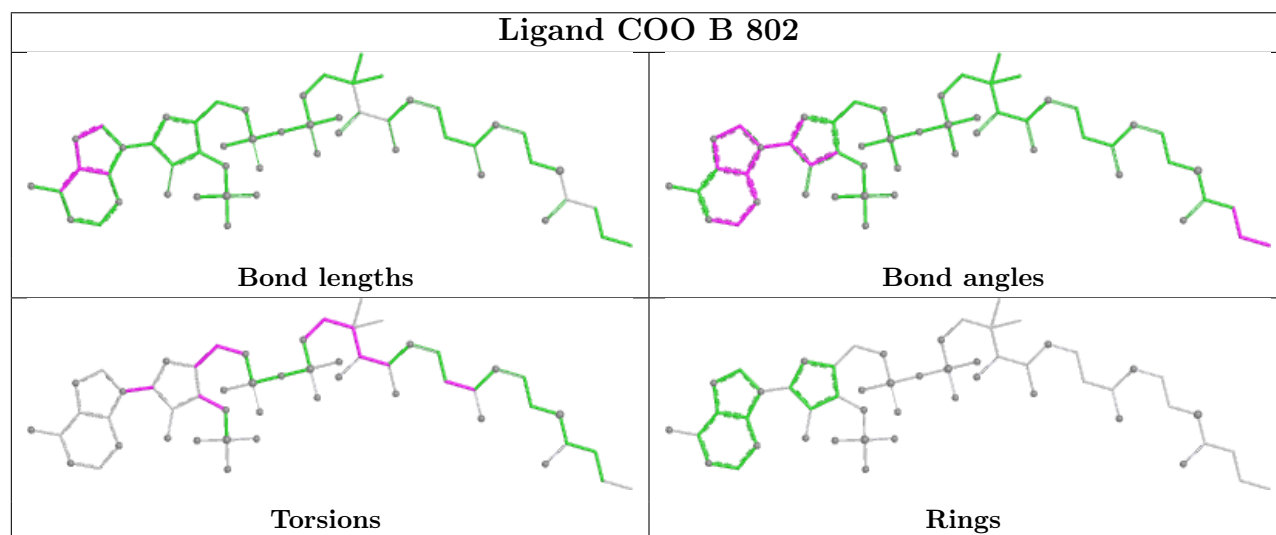
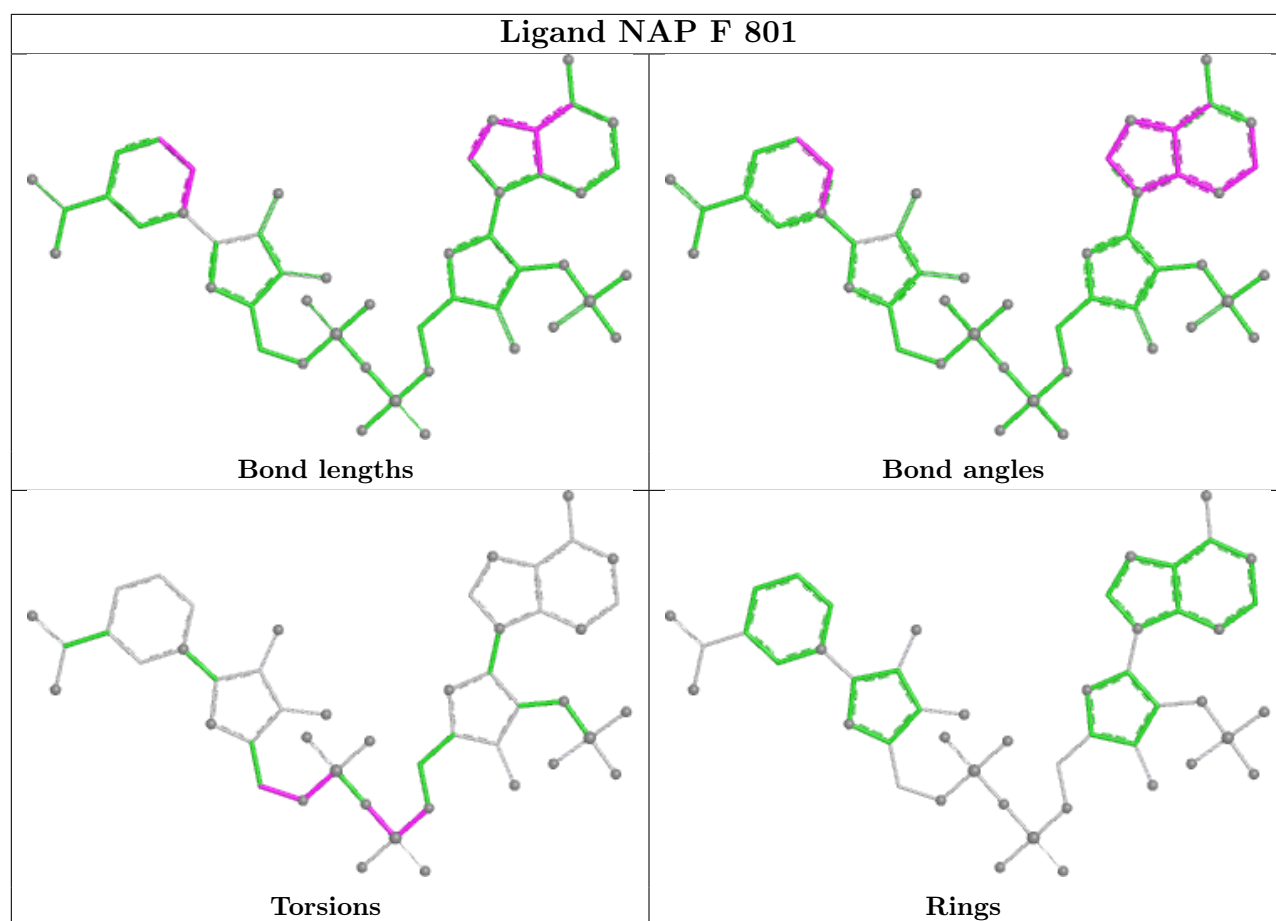
There are no ring outliers.

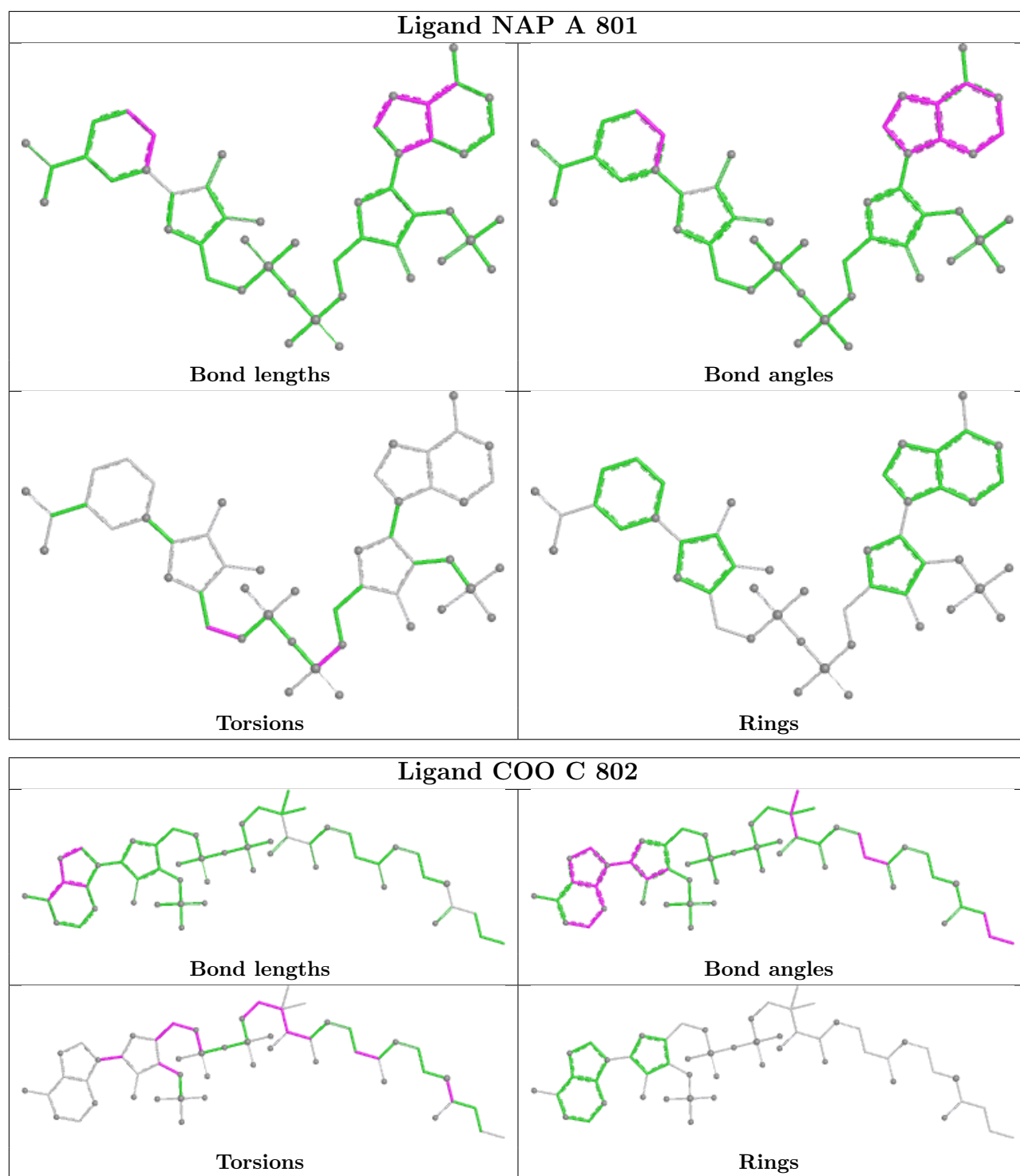
1 monomer is involved in 1 short contact:

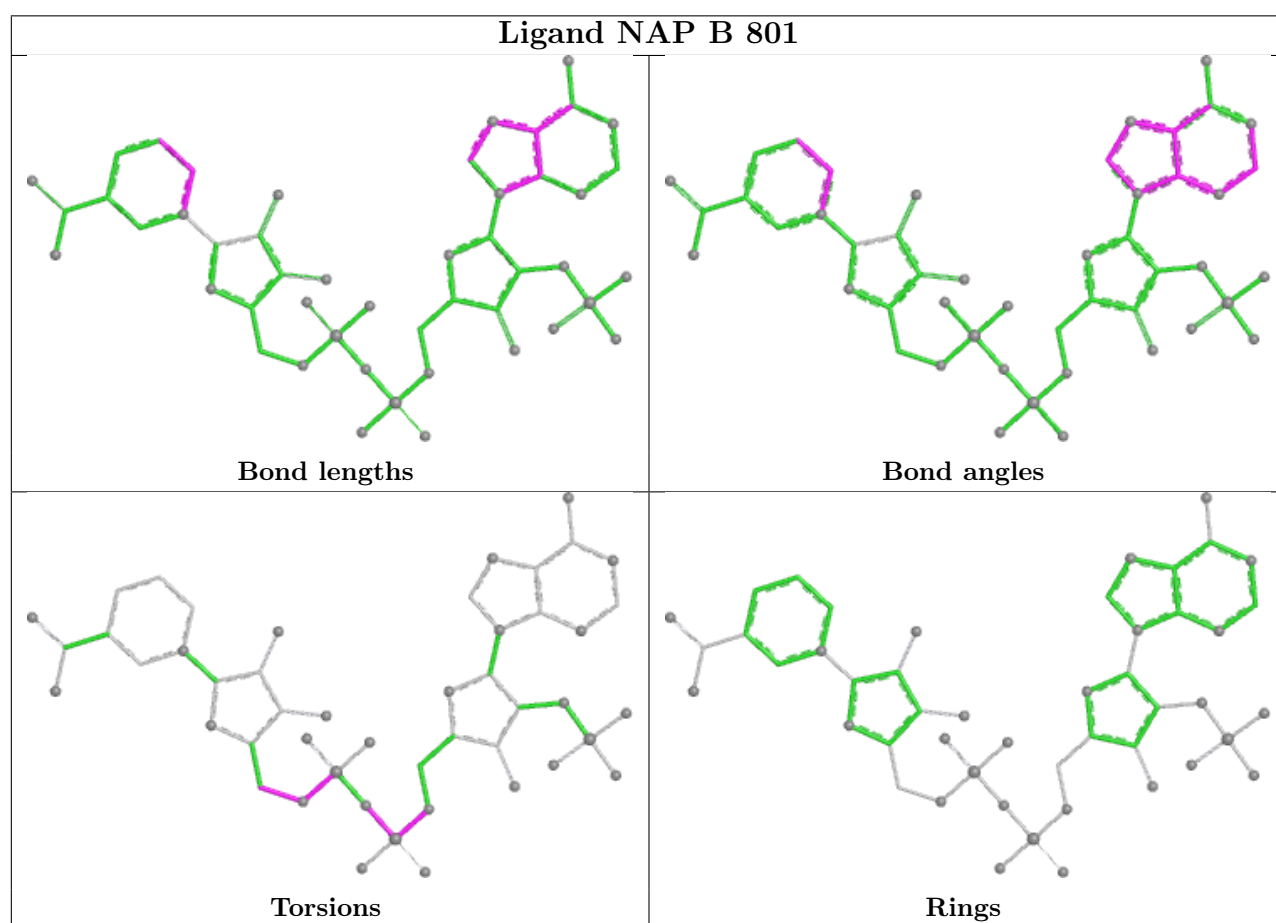
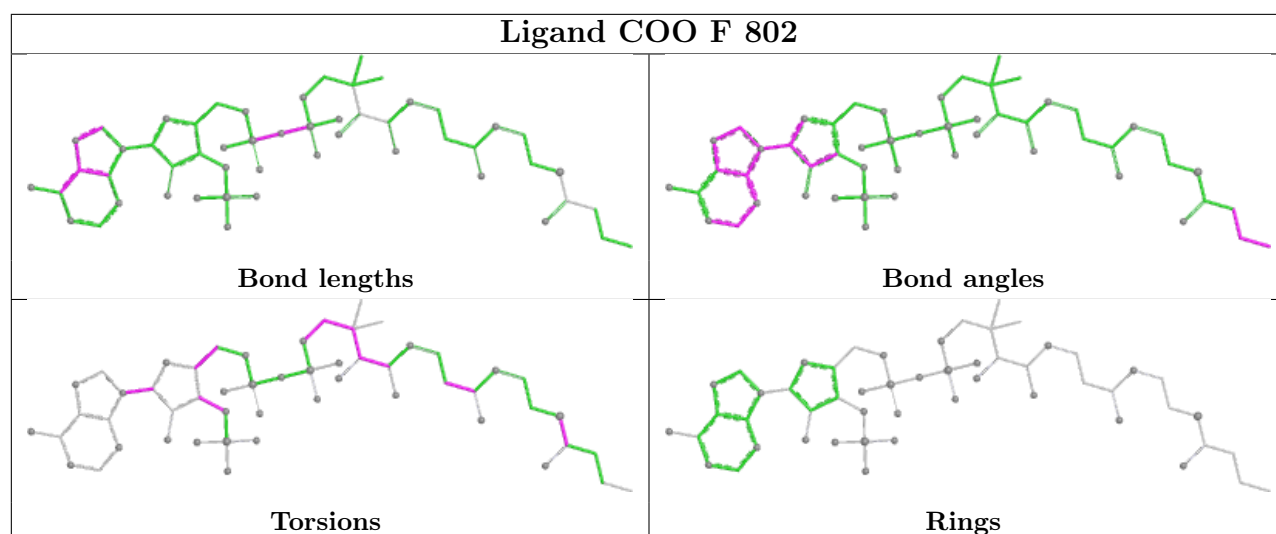
Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	802	COO	1	0

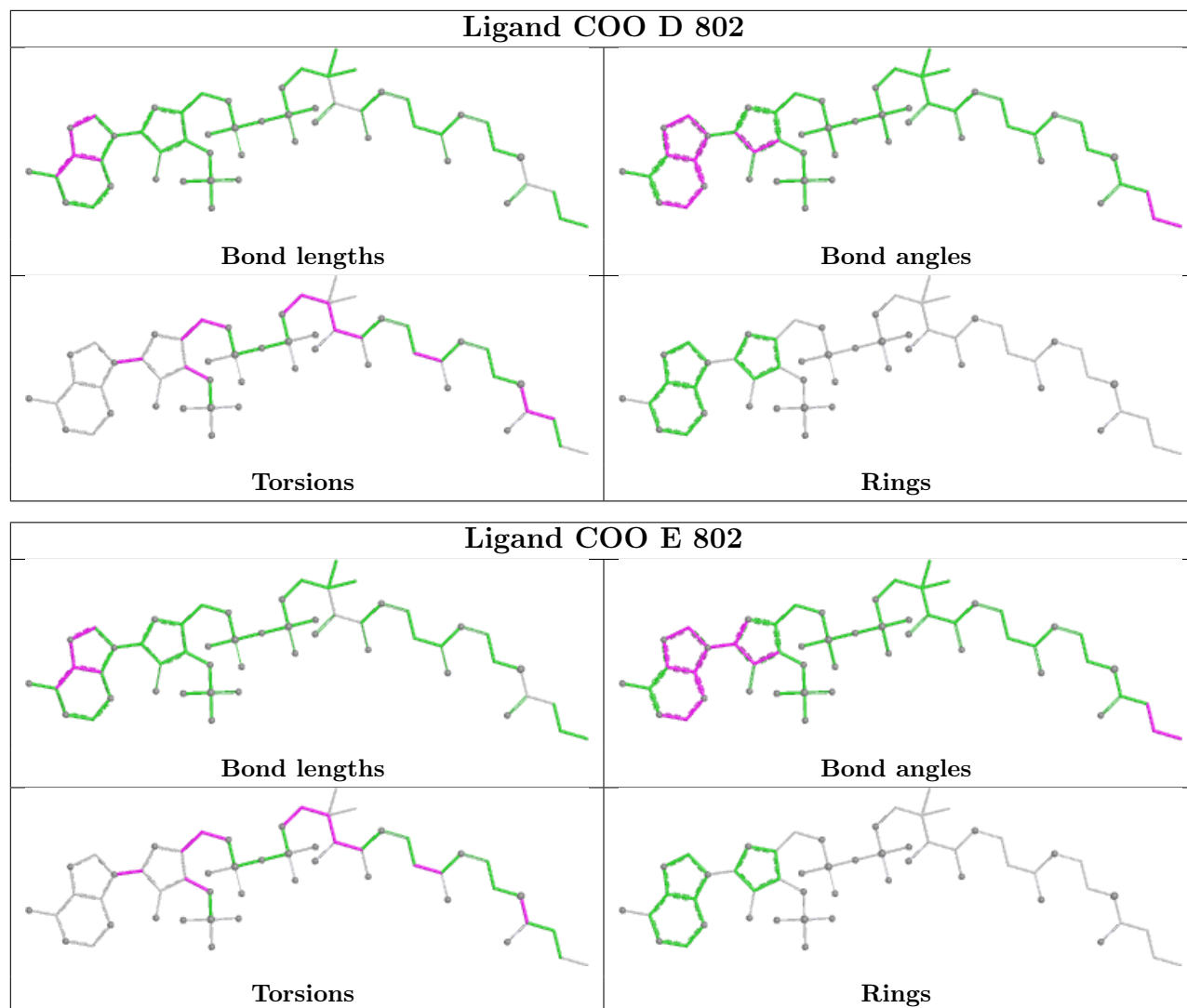
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

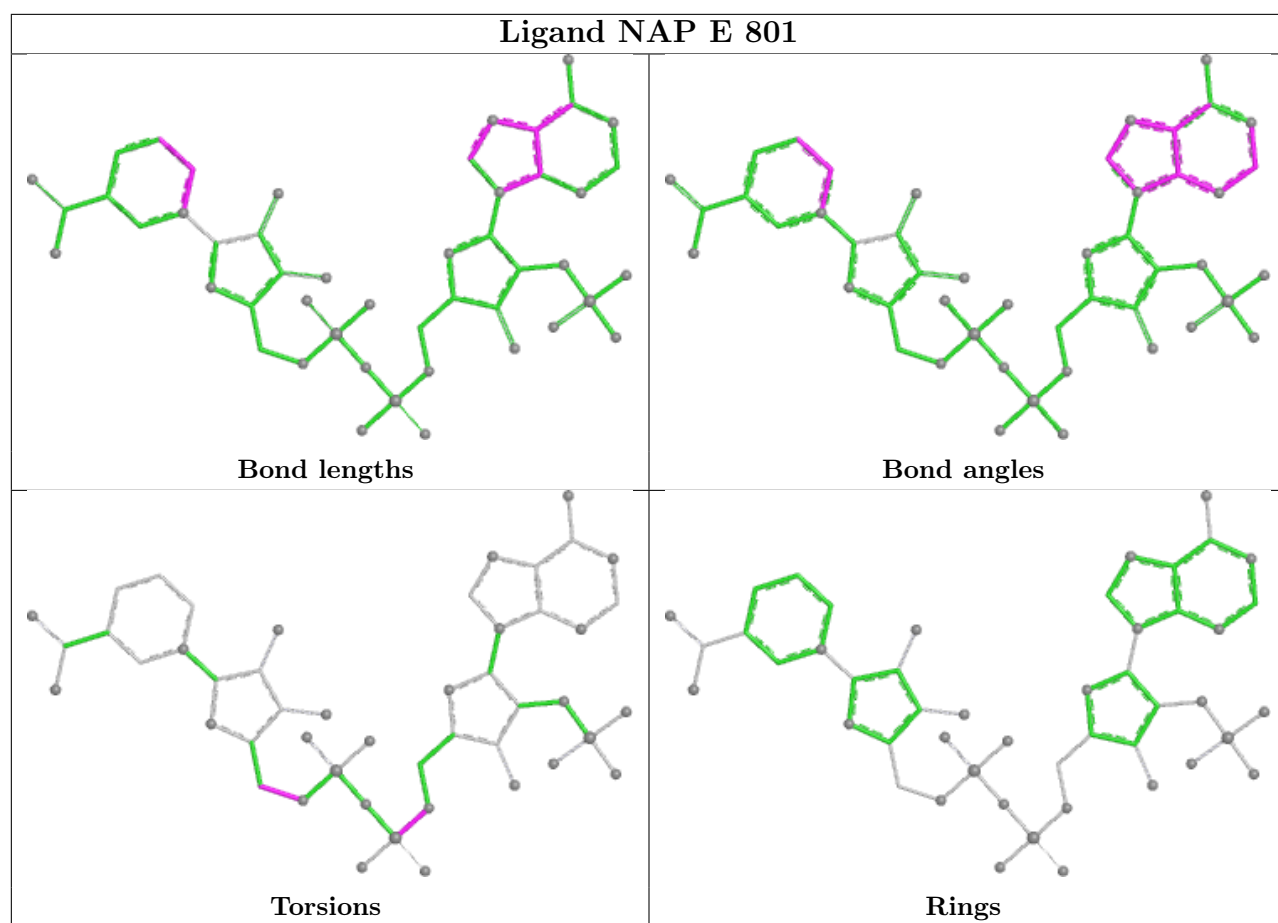


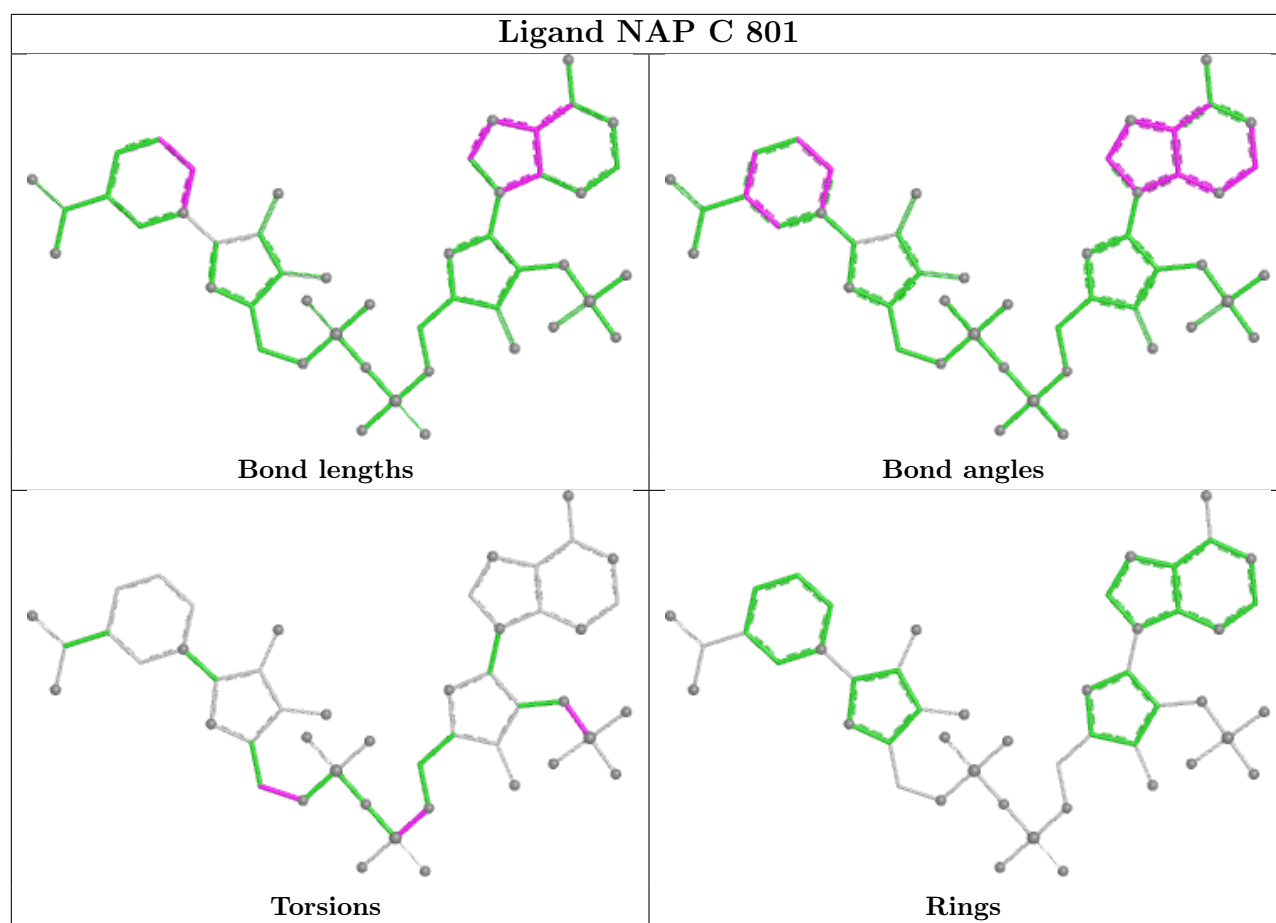












5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

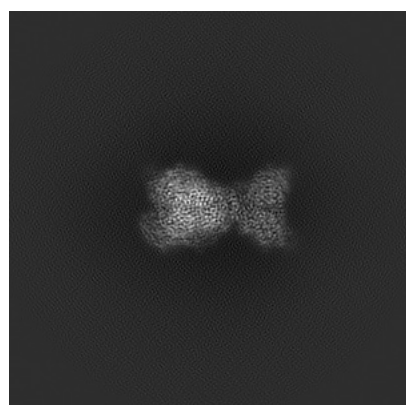
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-9876. These allow visual inspection of the internal detail of the map and identification of artifacts.

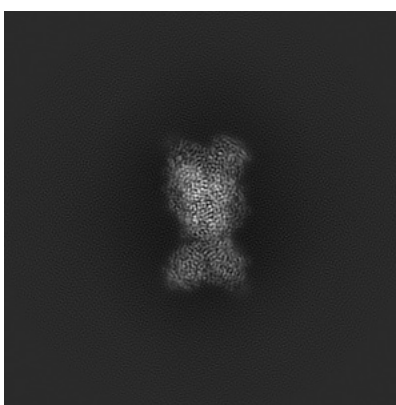
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

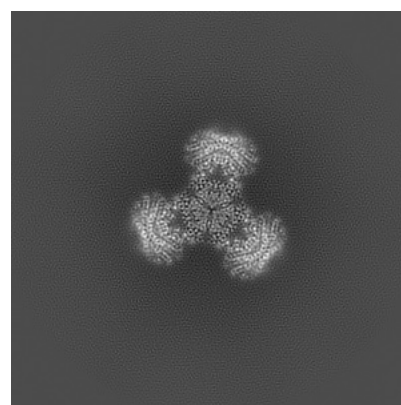
6.1.1 Primary map



X



Y

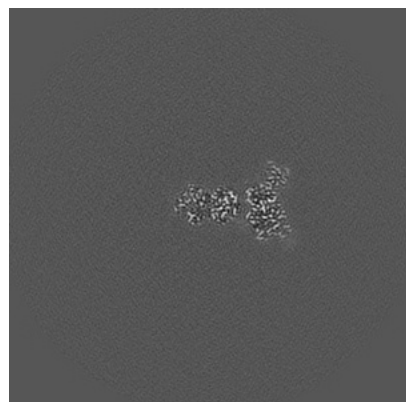


Z

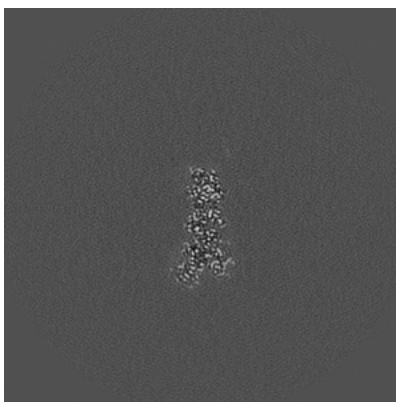
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

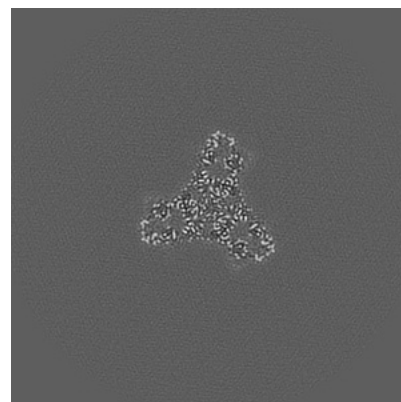
6.2.1 Primary map



X Index: 206



Y Index: 206

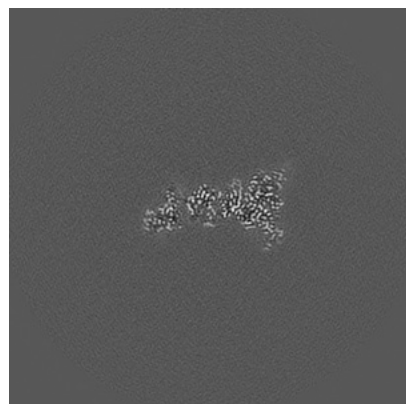


Z Index: 206

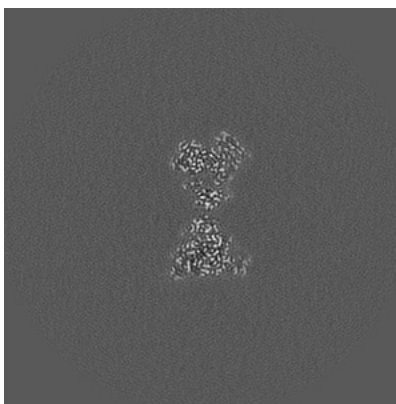
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

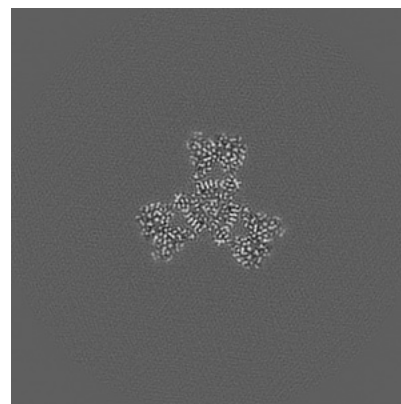
6.3.1 Primary map



X Index: 227



Y Index: 176

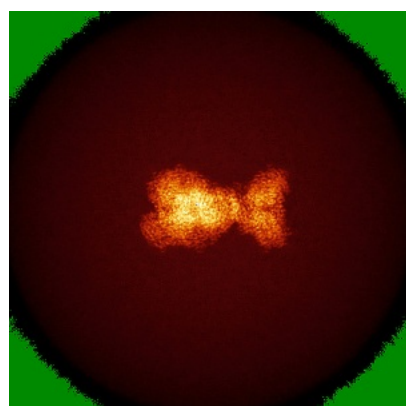


Z Index: 217

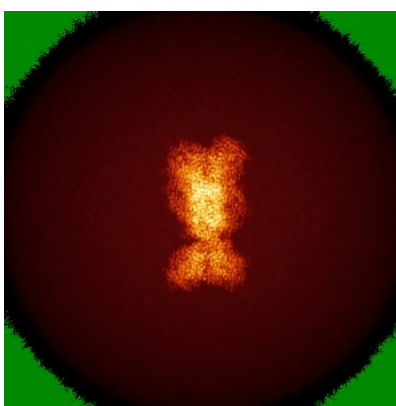
The images above show the largest variance slices of the map in three orthogonal directions.

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

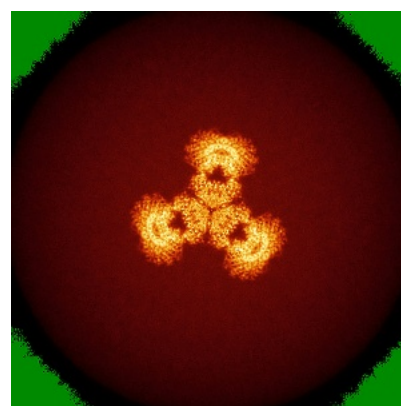
6.4.1 Primary map



X



Y



Z

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

This section was not generated.

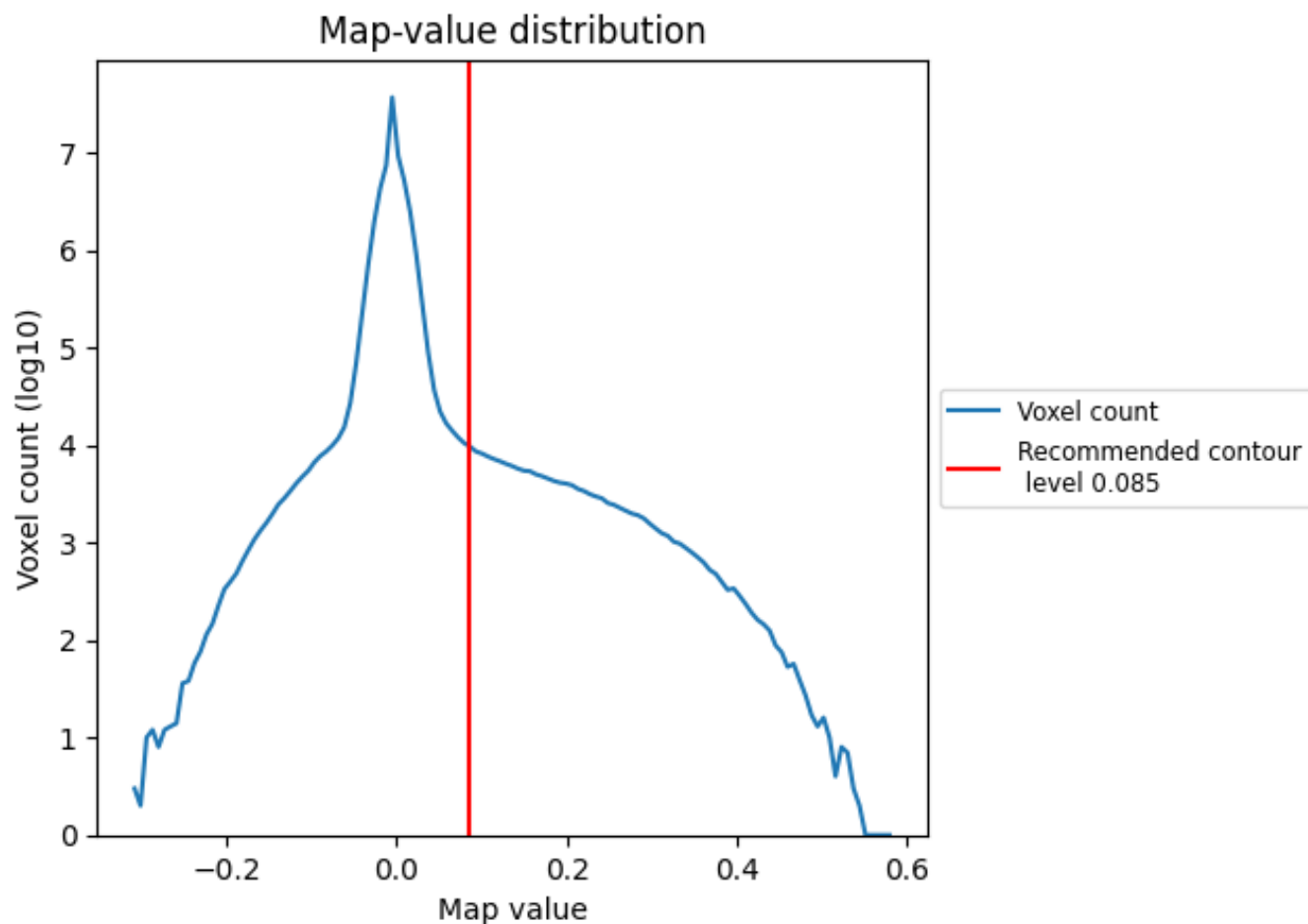
6.6 Mask visualisation

This section was not generated. No masks/segmentation were deposited.

7 Map analysis [i](#)

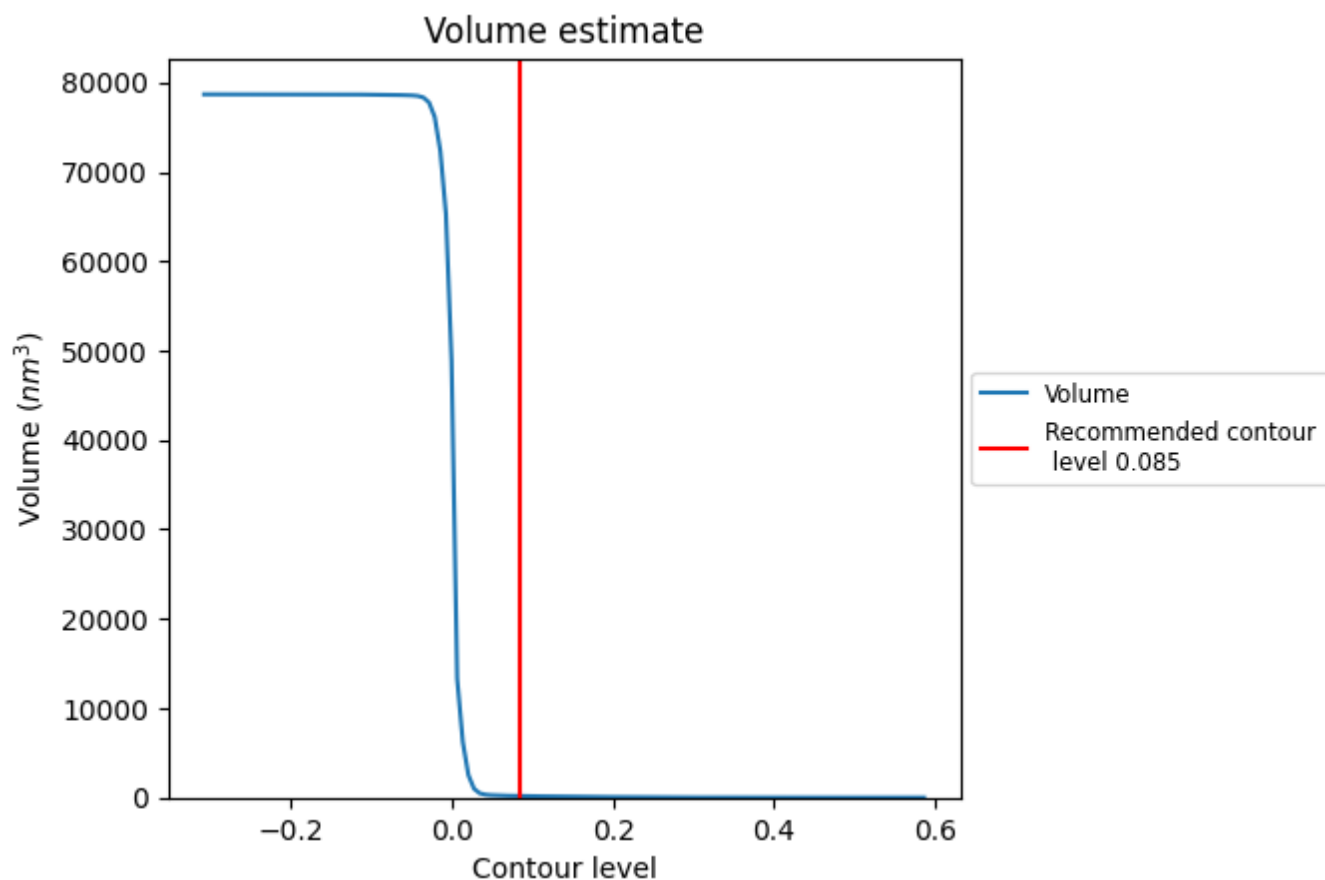
This section contains the results of statistical analysis of the map.

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.

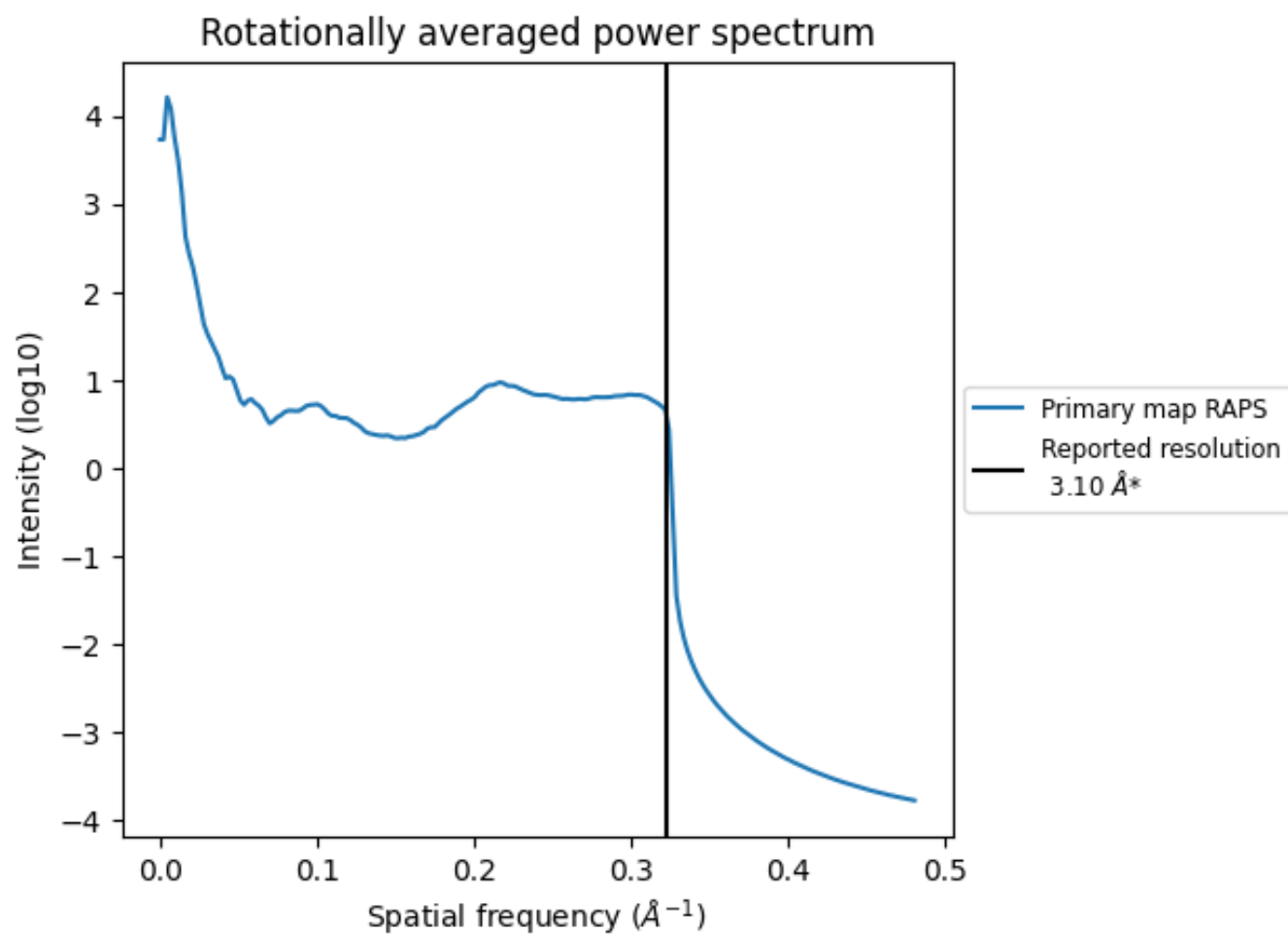
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 174 nm³; this corresponds to an approximate mass of 157 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 ⓘ

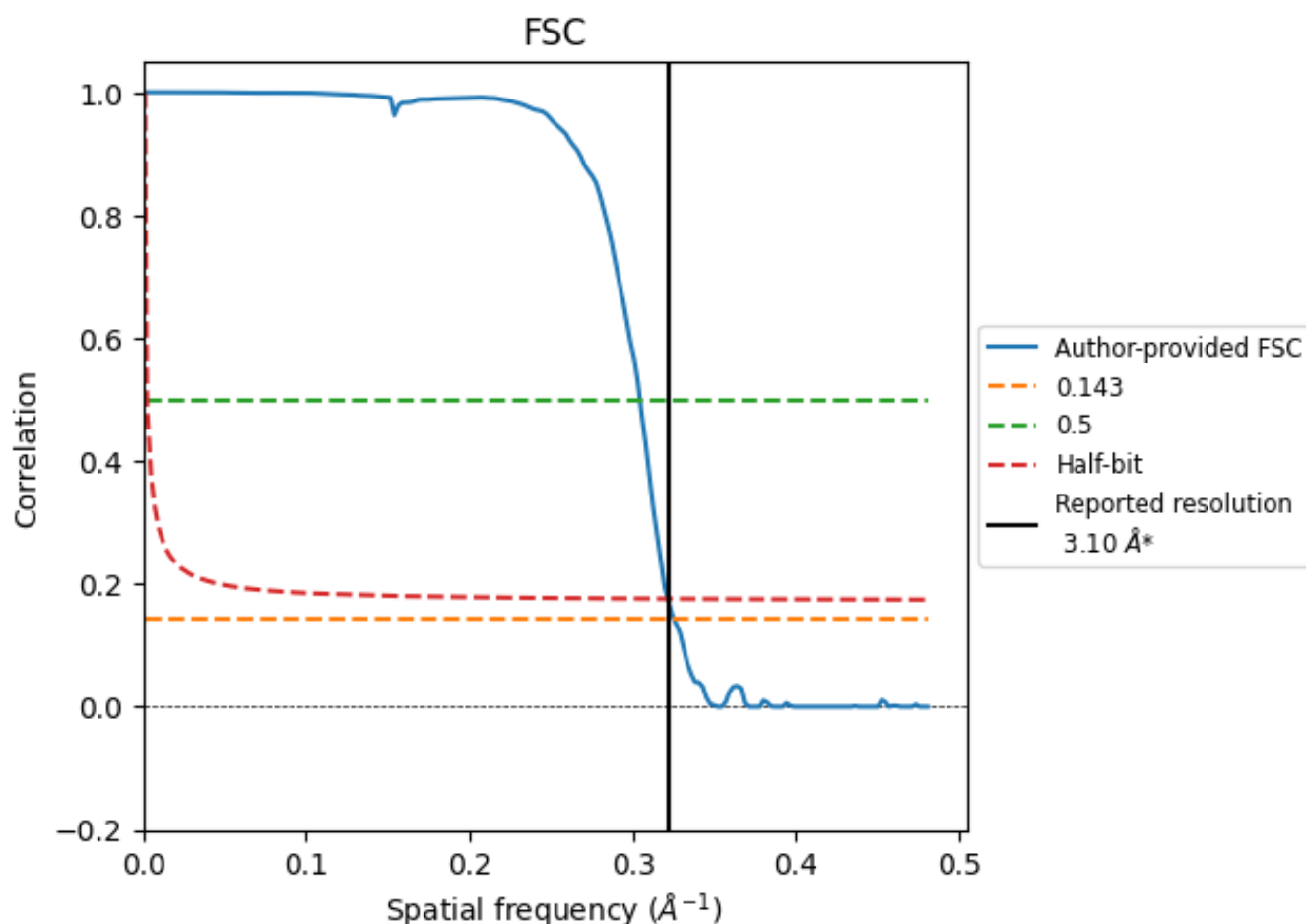


*Reported resolution corresponds to spatial frequency of 0.323 Å⁻¹

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 0.323 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

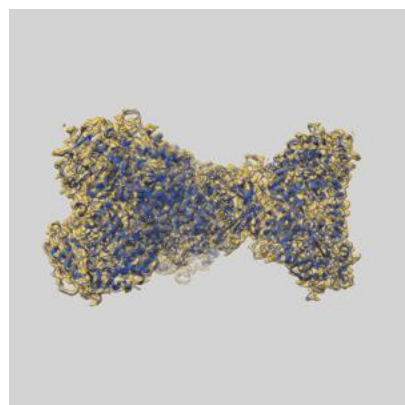
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	3.07	3.28	3.11
Unmasked-calculated*	-	-	-

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

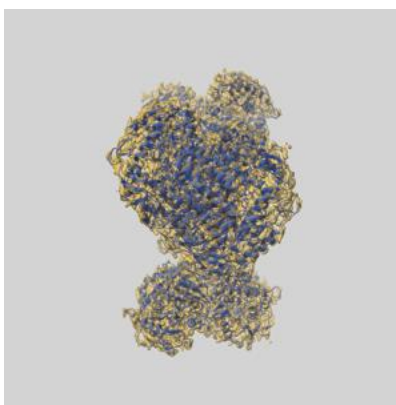
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-9876 and PDB model 6JQO. Per-residue inclusion information can be found in section 3 on page 8.

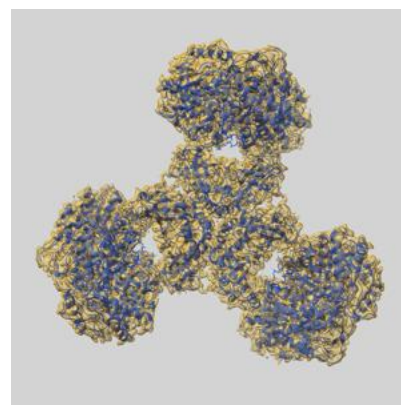
9.1 Map-model overlay [i](#)



X



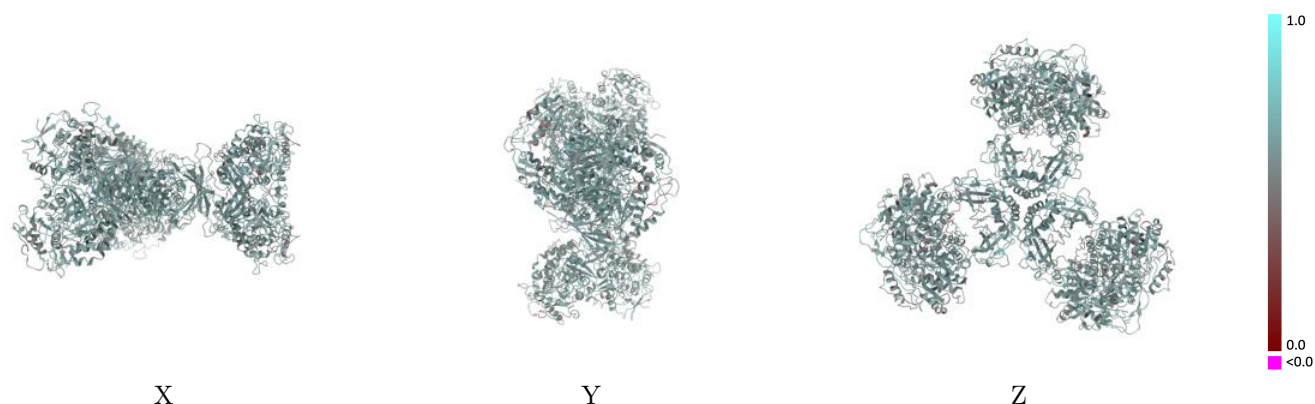
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.085 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](#)

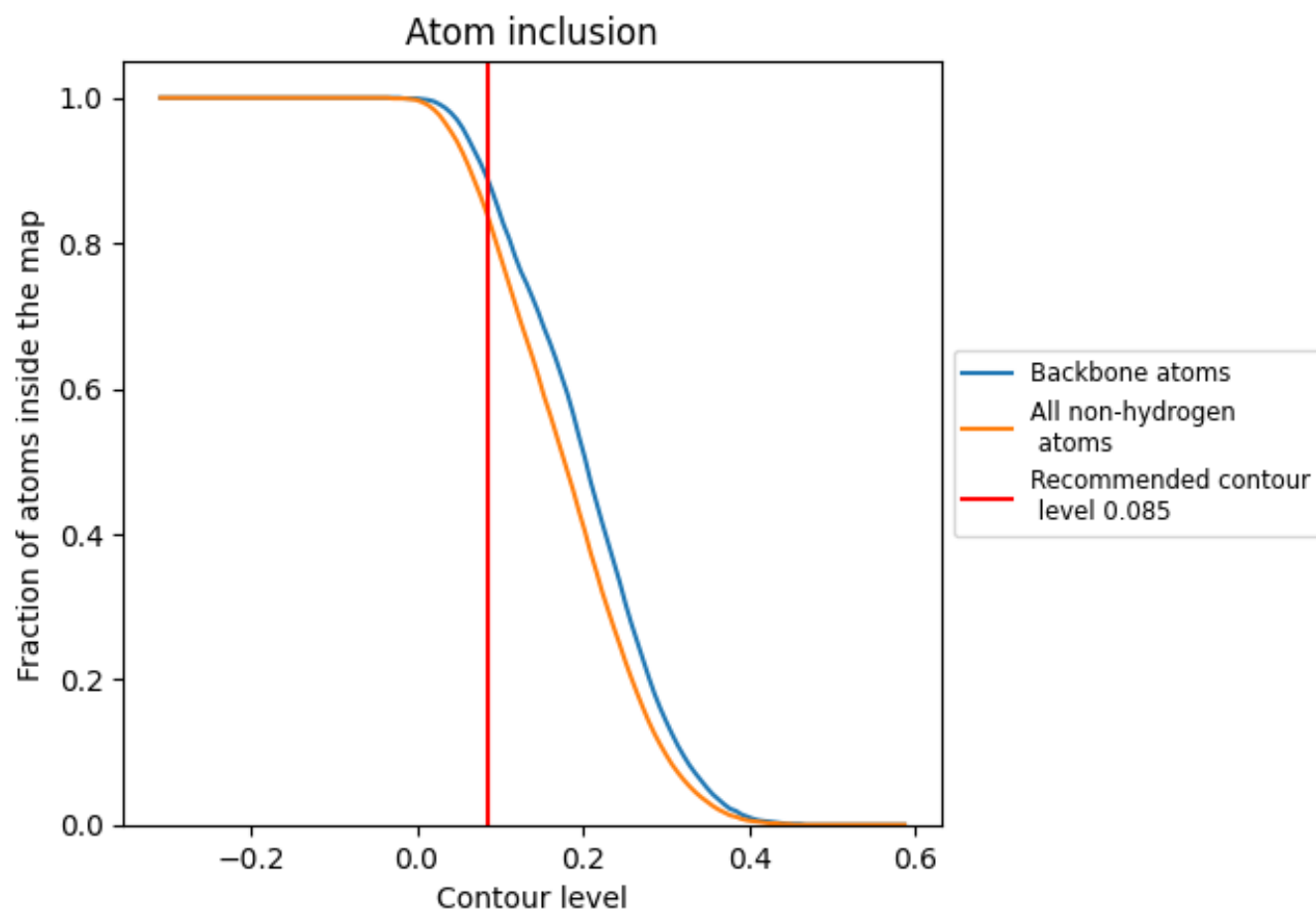


The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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](#)

This section was not generated.

9.4 Atom inclusion [i](#)



At the recommended contour level, 89% of all backbone atoms, 84% 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 (0.085) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8390	0.5720
A	0.8360	0.5710
B	0.8410	0.5720
C	0.8370	0.5710
D	0.8440	0.5730
E	0.8330	0.5720
F	0.8440	0.5720

1.0

0.0

<0.0