



Full wwPDB EM Validation Report ⓘ

Mar 8, 2026 – 04:48 PM UTC

PDB ID : 8ZRY / pdb_00008zry
EMDB ID : EMD-60409
Title : Structure of human ECHS1 in complex with Crotonoyl-CoA
Authors : Su, G.; Xu, Y.; Chen, B.; Ju, K.; Sun, X.; Jin, Y.; Liu, D.; Chen, H.; Zhang, S.; Luan, X.
Deposited on : 2024-06-05
Resolution : 2.23 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:

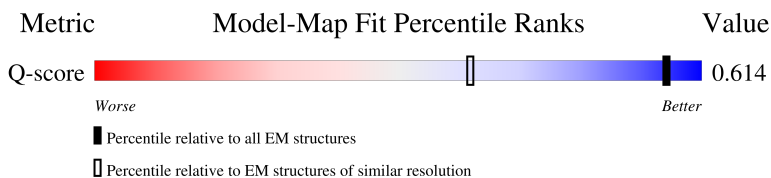
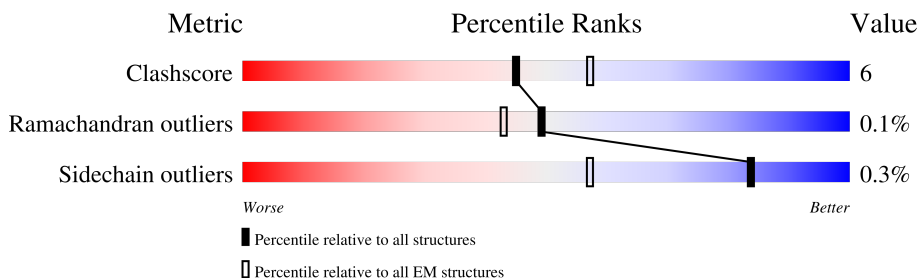
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data 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 2.23 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	3335 (1.73 - 2.73)

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	263	 82% 17% .
1	B	263	 85% 14% .
1	C	263	 83% 16% .
1	D	263	 79% 19% ..

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Mol	Chain	Length	Quality of chain
1	E	263	79% 19%
1	F	263	79% 20%

2 Entry composition [i](#)

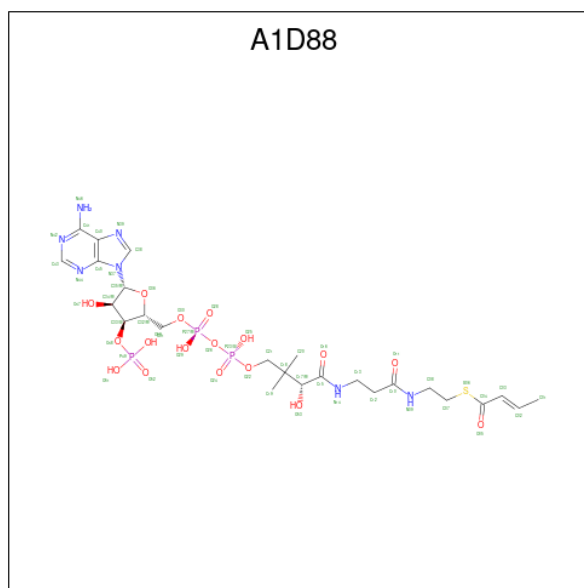
There are 4 unique types of molecules in this entry. The entry contains 24128 atoms, of which 11982 are hydrogens and 0 are deuteriums.

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 Enoyl-CoA hydratase, mitochondrial.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	260	Total 3966	1242	1997	333	380	14	0	0
1	B	260	Total 3966	1242	1997	333	380	14	0	0
1	C	260	Total 3966	1242	1997	333	380	14	0	0
1	D	260	Total 3966	1242	1997	333	380	14	0	0
1	E	260	Total 3966	1242	1997	333	380	14	0	0
1	F	260	Total 3966	1242	1997	333	380	14	0	0

- Molecule 2 is S-[2-[3-[(2R)-4-[[[(2R,3S,4R,5R)-5-(6-aminopurin-9-yl)-4-oxidanyl-3-phosphonooxy-oxolan-2-yl]methoxy-oxidanyl-phosphoryl]oxy-oxidanyl-phosphoryl]oxy-3,3-dimethyl-2-oxidanyl-butanoyl]amino]propanoylamino]ethyl] (E)-but-2-enethioate (CCD ID: A1D88) (formula: C₂₅H₄₀N₇O₁₇P₃S) (labeled as "Ligand of Interest" by depositor).



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

- Molecule 3 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
3	A	1	Total	Mg	0
			1	1	
3	D	1	Total	Mg	0
			1	1	

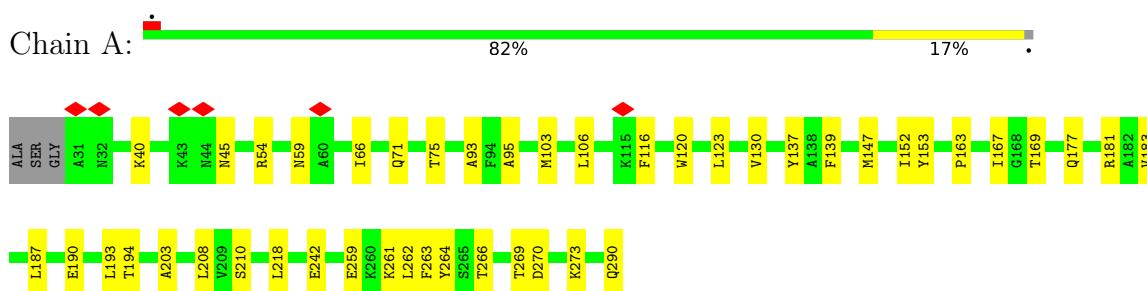
- Molecule 4 is water.

Mol	Chain	Residues	Atoms		AltConf
4	A	2	Total	O	0
			2	2	
4	B	2	Total	O	0
			2	2	
4	C	2	Total	O	0
			2	2	
4	D	2	Total	O	0
			2	2	
4	E	2	Total	O	0
			2	2	
4	F	2	Total	O	0
			2	2	

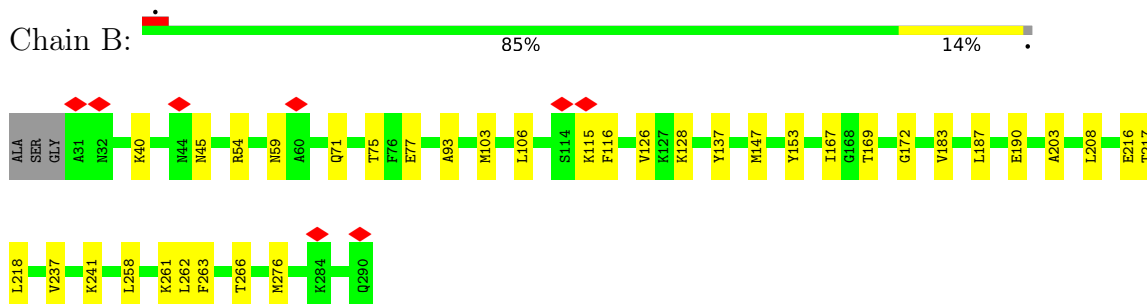
3 Residue-property plots [i](#)

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.

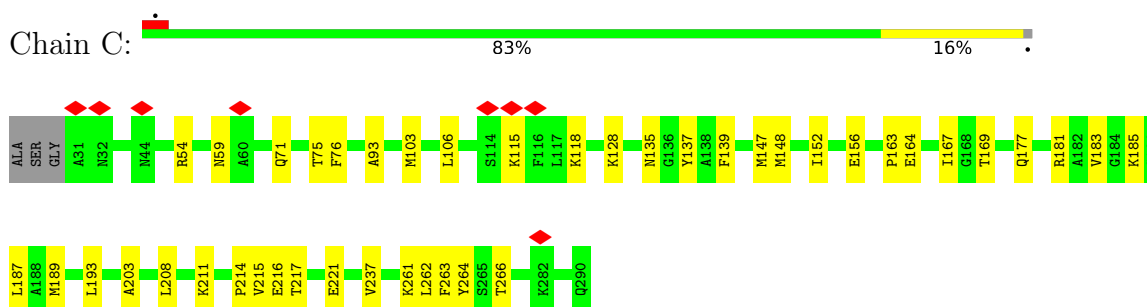
- Molecule 1: Enoyl-CoA hydratase, mitochondrial



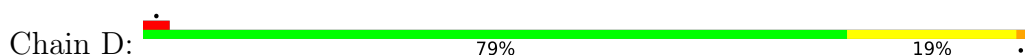
- Molecule 1: Enoyl-CoA hydratase, mitochondrial

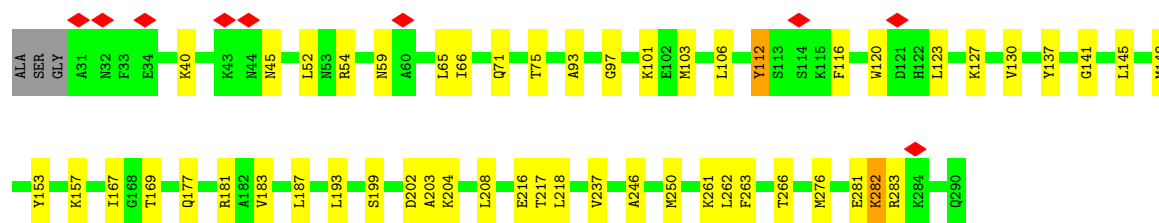


- Molecule 1: Enoyl-CoA hydratase, mitochondrial

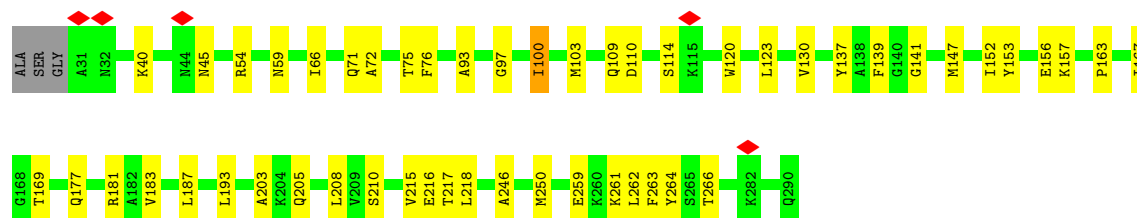
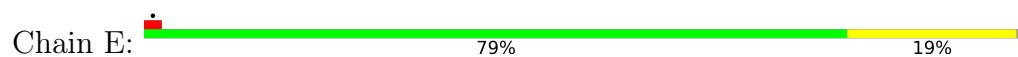


- Molecule 1: Enoyl-CoA hydratase, mitochondrial

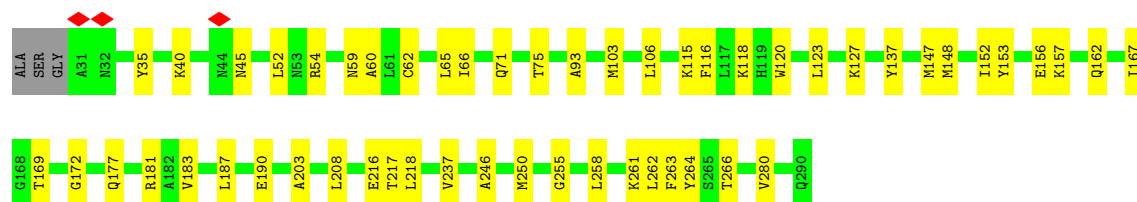
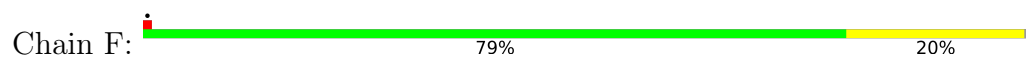




- Molecule 1: Enoyl-CoA hydratase, mitochondrial



- Molecule 1: Enoyl-CoA hydratase, mitochondrial



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	258292	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	5000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	4.321	Depositor
Minimum map value	-2.718	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.145	Depositor
Recommended contour level	0.53	Depositor
Map size ($\text{\AA}$)	210.944, 210.944, 210.944	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	0.824, 0.824, 0.824	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: MG, A1D88

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	0.10	0/1995	0.32	0/2681
1	B	0.10	0/1995	0.32	0/2681
1	C	0.22	0/1995	0.34	0/2681
1	D	0.26	1/1995 (0.1%)	0.45	5/2681 (0.2%)
1	E	0.29	0/1995	0.38	0/2681
1	F	0.11	0/1995	0.33	0/2681
All	All	0.20	1/11970 (0.0%)	0.36	5/16086 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	D	281	GLU	CA-C	-5.02	1.46	1.53

All (5) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	D	283	ARG	CA-C-N	-6.84	111.63	121.42
1	D	283	ARG	C-N-CA	-6.84	111.63	121.42
1	D	281	GLU	N-CA-C	-5.84	96.89	107.75
1	D	283	ARG	N-CA-C	5.75	116.14	108.38
1	D	112	TYR	N-CA-C	-5.10	104.67	111.24

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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	1969	1997	1996	29	0
1	B	1969	1997	1996	24	0
1	C	1969	1997	1996	28	0
1	D	1969	1997	1996	30	0
1	E	1969	1997	1996	34	0
1	F	1969	1997	1996	36	0
2	A	53	0	0	1	0
2	B	53	0	0	0	0
2	C	53	0	0	0	0
2	D	53	0	0	0	0
2	E	53	0	0	0	0
2	F	53	0	0	0	0
3	A	1	0	0	0	0
3	D	1	0	0	0	0
4	A	2	0	0	0	0
4	B	2	0	0	0	0
4	C	2	0	0	1	0
4	D	2	0	0	0	0
4	E	2	0	0	0	0
4	F	2	0	0	1	0
All	All	12146	11982	11976	151	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 6.

All (151) 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:E:72:ALA:O	1:E:76:PHE:HD2	1.49	0.94
1:E:72:ALA:O	1:E:76:PHE:CD2	2.24	0.90
1:B:71:GLN:O	1:B:75:THR:HG23	1.90	0.72
1:C:71:GLN:O	1:C:75:THR:HG23	1.90	0.72
1:F:71:GLN:O	1:F:75:THR:HG23	1.90	0.71
1:D:71:GLN:O	1:D:75:THR:HG23	1.89	0.71
1:C:115:LYS:HE3	1:F:127:LYS:HE2	1.71	0.71
1:A:71:GLN:O	1:A:75:THR:HG23	1.90	0.70
1:E:71:GLN:O	1:E:75:THR:HG23	1.90	0.70
1:B:115:LYS:HE3	1:D:127:LYS:HE2	1.77	0.66
1:D:204:LYS:O	1:E:205:GLN:NE2	2.31	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:115:LYS:HB3	1:C:118:LYS:HB3	1.81	0.63
1:F:250:MET:HE3	1:F:255:GLY:HA2	1.81	0.63
1:B:153:TYR:HB3	1:B:218:LEU:HD11	1.81	0.63
1:D:116:PHE:O	1:F:264:TYR:OH	2.16	0.62
1:D:276:MET:HE1	1:E:103:MET:HG3	1.82	0.62
1:F:162:GLN:O	4:F:401:HOH:O	2.16	0.60
1:D:153:TYR:HB3	1:D:218:LEU:HD11	1.82	0.60
1:F:123:LEU:HD12	1:F:148:MET:HE3	1.82	0.59
1:E:153:TYR:HB3	1:E:218:LEU:HD11	1.84	0.59
1:D:246:ALA:HB1	1:D:250:MET:HE2	1.83	0.59
1:B:261:LYS:HD3	1:F:262:LEU:HD21	1.84	0.59
1:B:237:VAL:HG13	1:C:193:LEU:HD22	1.85	0.59
1:A:242:GLU:OE1	1:D:261:LYS:NZ	2.36	0.59
1:C:262:LEU:HD21	1:E:261:LYS:HD3	1.83	0.58
1:F:103:MET:HA	1:F:106:LEU:HD13	1.84	0.58
1:A:153:TYR:HB3	1:A:218:LEU:HD11	1.86	0.58
1:A:183:VAL:HB	1:A:187:LEU:HD23	1.84	0.58
1:C:216:GLU:HG2	1:C:217:THR:HG23	1.87	0.57
1:F:183:VAL:HB	1:F:187:LEU:HD23	1.87	0.57
1:F:54:ARG:HG3	1:F:59:ASN:HA	1.86	0.57
1:B:54:ARG:HB3	1:B:59:ASN:HA	1.87	0.57
1:D:103:MET:HA	1:D:106:LEU:HD13	1.86	0.57
1:A:93:ALA:HA	1:A:137:TYR:H	1.70	0.57
1:A:193:LEU:HD22	1:C:237:VAL:HG13	1.87	0.56
1:B:203:ALA:HB1	1:B:208:LEU:HB3	1.87	0.56
1:F:153:TYR:HB3	1:F:218:LEU:HD11	1.86	0.56
1:D:203:ALA:HB1	1:D:208:LEU:HB3	1.88	0.56
1:A:261:LYS:HD3	1:D:262:LEU:HD21	1.88	0.56
1:F:54:ARG:NH1	1:F:62:CYS:SG	2.79	0.56
1:C:203:ALA:HB1	1:C:208:LEU:HB3	1.87	0.56
1:F:40:LYS:HE2	1:F:45:ASN:HB3	1.88	0.55
1:C:261:LYS:HD3	1:E:262:LEU:HD21	1.88	0.55
1:D:183:VAL:HB	1:D:187:LEU:HD23	1.89	0.55
1:F:246:ALA:HB1	1:F:250:MET:HE2	1.89	0.54
1:E:183:VAL:HB	1:E:187:LEU:HD23	1.89	0.54
1:C:167:ILE:HG13	1:C:169:THR:HG22	1.90	0.54
1:B:93:ALA:HA	1:B:137:TYR:H	1.73	0.53
1:E:40:LYS:HE2	1:E:45:ASN:HB3	1.91	0.53
1:D:54:ARG:HB3	1:D:59:ASN:HA	1.90	0.52
1:E:167:ILE:HG13	1:E:169:THR:HG22	1.91	0.52
1:E:264:TYR:OH	1:F:116:PHE:O	2.25	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:167:ILE:HG13	1:D:169:THR:HG22	1.92	0.52
1:D:93:ALA:HA	1:D:137:TYR:H	1.74	0.52
1:E:246:ALA:HB1	1:E:250:MET:HE2	1.92	0.52
1:A:54:ARG:HB3	1:A:59:ASN:HA	1.92	0.51
1:D:123:LEU:HD11	1:D:130:VAL:HG11	1.92	0.51
1:E:203:ALA:HB1	1:E:208:LEU:HB3	1.92	0.51
1:B:183:VAL:HB	1:B:187:LEU:HD23	1.92	0.51
1:A:116:PHE:O	1:C:264:TYR:OH	2.20	0.51
1:D:276:MET:HE3	1:E:100:ILE:HD12	1.91	0.51
1:F:54:ARG:NH1	1:F:60:ALA:O	2.43	0.51
1:B:263:PHE:O	1:B:266:THR:OG1	2.26	0.51
1:A:264:TYR:OH	1:B:116:PHE:O	2.20	0.51
1:D:216:GLU:HG2	1:D:217:THR:HG23	1.92	0.51
1:C:103:MET:HA	1:C:106:LEU:HD13	1.93	0.51
1:F:156:GLU:HG3	1:F:157:LYS:HG3	1.93	0.51
1:A:210:SER:OG	1:B:190:GLU:OE1	2.26	0.50
1:B:126:VAL:HG12	1:B:128:LYS:H	1.76	0.50
1:C:93:ALA:HA	1:C:137:TYR:H	1.76	0.50
1:C:183:VAL:HB	1:C:187:LEU:HD23	1.92	0.50
1:E:72:ALA:HB1	1:E:76:PHE:HE2	1.77	0.50
1:F:93:ALA:HA	1:F:137:TYR:H	1.76	0.50
1:F:167:ILE:HG13	1:F:169:THR:HG22	1.94	0.49
1:C:211:LYS:NZ	1:C:221:GLU:OE1	2.40	0.49
1:C:76:PHE:O	1:C:128:LYS:NZ	2.45	0.49
1:A:190:GLU:O	1:A:194:THR:OG1	2.27	0.49
1:D:145:LEU:HA	1:D:148:MET:HE2	1.93	0.49
1:D:199:SER:OG	1:D:202:ASP:OD1	2.30	0.49
1:B:216:GLU:HG2	1:B:217:THR:HG23	1.94	0.49
1:A:103:MET:HA	1:A:106:LEU:HD13	1.94	0.49
1:A:167:ILE:HG13	1:A:169:THR:HG22	1.95	0.48
1:A:262:LEU:HD21	1:D:261:LYS:HD3	1.95	0.48
1:B:258:LEU:HD12	1:F:258:LEU:HD12	1.94	0.48
1:F:250:MET:HE1	1:F:258:LEU:HD13	1.95	0.48
1:D:193:LEU:HD22	1:F:237:VAL:HG13	1.95	0.48
1:A:203:ALA:HB1	1:A:208:LEU:HB3	1.95	0.48
1:B:103:MET:HA	1:B:106:LEU:HD13	1.96	0.48
1:B:167:ILE:HG13	1:B:169:THR:HG22	1.96	0.48
1:C:54:ARG:HB3	1:C:59:ASN:HA	1.96	0.48
1:E:156:GLU:HG2	1:E:215:VAL:HG13	1.96	0.48
1:F:263:PHE:O	1:F:266:THR:OG1	2.31	0.47
1:A:139:PHE:HB3	1:A:163:PRO:HG3	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:E:216:GLU:HG2	1:E:217:THR:HG23	1.96	0.47
1:F:52:LEU:HD22	1:F:65:LEU:HD11	1.97	0.47
1:E:259:GLU:HG2	1:F:172:GLY:HA2	1.96	0.47
1:F:203:ALA:HB1	1:F:208:LEU:HB3	1.96	0.47
1:C:135:ASN:HD21	1:C:215:VAL:HG13	1.79	0.47
1:F:216:GLU:HG2	1:F:217:THR:HG23	1.97	0.46
1:A:40:LYS:NZ	1:A:45:ASN:O	2.49	0.46
1:D:101:LYS:HE2	1:F:280:VAL:HG13	1.96	0.46
1:D:237:VAL:HG13	1:E:193:LEU:HD22	1.98	0.46
1:E:54:ARG:HB3	1:E:59:ASN:HA	1.97	0.46
1:E:147:MET:HA	1:E:152:ILE:HD11	1.98	0.46
1:C:147:MET:HA	1:C:152:ILE:HD11	1.97	0.45
1:E:93:ALA:HA	1:E:137:TYR:H	1.81	0.45
1:F:115:LYS:HB3	1:F:118:LYS:HB2	1.97	0.45
1:A:269:THR:HA	1:E:109:GLN:HE21	1.82	0.45
1:E:110:ASP:O	1:E:114:SER:OG	2.31	0.44
1:A:259:GLU:HG2	1:B:172:GLY:HA2	1.98	0.44
1:D:177:GLN:HB3	1:D:181:ARG:HH12	1.82	0.44
1:C:139:PHE:HB3	1:C:163:PRO:HG3	1.98	0.44
1:D:97:GLY:HA2	1:D:141:GLY:H	1.82	0.44
1:C:148:MET:HG3	4:C:402:HOH:O	2.18	0.44
1:B:262:LEU:HD21	1:F:261:LYS:HD3	1.99	0.43
1:B:40:LYS:HE2	1:B:45:ASN:HB3	2.00	0.43
1:D:66:ILE:HG13	1:D:120:TRP:NE1	2.34	0.43
1:E:97:GLY:HA2	1:E:141:GLY:H	1.84	0.43
1:A:270:ASP:HA	1:A:273:LYS:HE3	2.00	0.43
1:E:123:LEU:HD11	1:E:130:VAL:HG11	2.00	0.43
1:F:147:MET:HA	1:F:152:ILE:HD11	2.01	0.43
1:F:35:TYR:HB3	1:F:65:LEU:HD12	2.01	0.42
1:B:147:MET:O	1:C:185:LYS:NZ	2.45	0.42
1:A:263:PHE:O	1:A:266:THR:HG22	2.20	0.42
1:B:276:MET:HE1	1:C:103:MET:HE2	2.01	0.42
1:E:156:GLU:HG3	1:E:157:LYS:HG3	2.01	0.42
1:D:40:LYS:HE2	1:D:45:ASN:HB3	2.02	0.42
1:A:147:MET:HA	1:A:152:ILE:HD11	2.02	0.42
1:D:263:PHE:O	1:D:266:THR:HG22	2.20	0.42
1:E:263:PHE:O	1:E:266:THR:HG22	2.20	0.42
1:F:66:ILE:HG13	1:F:120:TRP:NE1	2.35	0.42
1:A:66:ILE:HG13	1:A:120:TRP:NE1	2.34	0.42
1:C:156:GLU:HG2	1:C:214:PRO:HA	2.02	0.42
1:C:164:GLU:HB3	1:C:169:THR:HG23	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:77:GLU:HG3	1:B:126:VAL:HG13	2.01	0.41
1:C:263:PHE:O	1:C:266:THR:HG22	2.19	0.41
1:A:59:ASN:HB2	1:A:95:ALA:HA	2.03	0.41
1:F:177:GLN:HB3	1:F:181:ARG:HH12	1.86	0.41
1:E:139:PHE:HB3	1:E:163:PRO:HG3	2.03	0.41
1:E:177:GLN:HB3	1:E:181:ARG:HH12	1.86	0.41
1:E:66:ILE:HG13	1:E:120:TRP:NE1	2.35	0.41
1:A:177:GLN:HB3	1:A:181:ARG:HH12	1.86	0.41
1:A:163:PRO:HG2	2:A:301:A1D88:C10	2.51	0.41
1:A:270:ASP:HB2	1:A:290:GLN:HG3	2.03	0.41
1:C:177:GLN:HB3	1:C:181:ARG:HH12	1.87	0.40
1:A:123:LEU:HD11	1:A:130:VAL:HG11	2.02	0.40
1:D:52:LEU:HD22	1:D:65:LEU:HD21	2.03	0.40
1:E:210:SER:OG	1:F:190:GLU:OE1	2.25	0.40
1:E:250:MET:HE3	1:E:250:MET:HB2	1.97	0.40
1:B:241:LYS:HG3	1:C:189:MET:HE1	2.04	0.40
1:F:115:LYS:HA	1:F:115:LYS:HD3	1.83	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	258/263 (98%)	257 (100%)	1 (0%)	0	100	100
1	B	258/263 (98%)	257 (100%)	1 (0%)	0	100	100
1	C	258/263 (98%)	254 (98%)	4 (2%)	0	100	100
1	D	258/263 (98%)	254 (98%)	3 (1%)	1 (0%)	30	30
1	E	258/263 (98%)	255 (99%)	3 (1%)	0	100	100
1	F	258/263 (98%)	254 (98%)	4 (2%)	0	100	100
All	All	1548/1578 (98%)	1531 (99%)	16 (1%)	1 (0%)	49	54

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	282	LYS

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	205/206 (100%)	205 (100%)	0	100	100
1	B	205/206 (100%)	205 (100%)	0	100	100
1	C	205/206 (100%)	205 (100%)	0	100	100
1	D	205/206 (100%)	202 (98%)	3 (2%)	57	66
1	E	205/206 (100%)	204 (100%)	1 (0%)	81	86
1	F	205/206 (100%)	205 (100%)	0	100	100
All	All	1230/1236 (100%)	1226 (100%)	4 (0%)	84	90

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

Mol	Chain	Res	Type
1	D	112	TYR
1	D	157	LYS
1	D	282	LYS
1	E	100	ILE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (30) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	104	GLN
1	A	224	GLN
1	A	286	ASN
1	B	104	GLN
1	B	125	GLN
1	B	135	ASN
1	B	162	GLN

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Mol	Chain	Res	Type
1	B	224	GLN
1	B	290	GLN
1	C	104	GLN
1	C	125	GLN
1	C	162	GLN
1	C	205	GLN
1	C	224	GLN
1	D	104	GLN
1	D	135	ASN
1	D	159	GLN
1	D	224	GLN
1	E	44	ASN
1	E	104	GLN
1	E	125	GLN
1	E	159	GLN
1	E	162	GLN
1	E	205	GLN
1	E	224	GLN
1	F	104	GLN
1	F	125	GLN
1	F	162	GLN
1	F	224	GLN
1	F	286	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 ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

Of 8 ligands modelled in this entry, 2 are monoatomic - leaving 6 for Mogul analysis.

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	A1D88	D	301	-	51,55,55	2.55	17 (33%)	73,81,81	2.04	20 (27%)
2	A1D88	E	301	-	51,55,55	2.62	16 (31%)	73,81,81	2.02	22 (30%)
2	A1D88	F	301	-	51,55,55	2.56	16 (31%)	73,81,81	1.89	19 (26%)
2	A1D88	B	301	-	51,55,55	2.58	18 (35%)	73,81,81	2.74	25 (34%)
2	A1D88	C	301	-	51,55,55	2.70	16 (31%)	73,81,81	1.65	18 (24%)
2	A1D88	A	301	-	51,55,55	2.56	16 (31%)	73,81,81	2.50	24 (32%)

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	A1D88	D	301	-	-	7/54/70/70	0/3/3/3
2	A1D88	E	301	-	-	10/54/70/70	0/3/3/3
2	A1D88	F	301	-	-	8/54/70/70	0/3/3/3
2	A1D88	B	301	-	-	12/54/70/70	0/3/3/3
2	A1D88	C	301	-	-	19/54/70/70	0/3/3/3
2	A1D88	A	301	-	-	12/54/70/70	0/3/3/3

All (99) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	301	A1D88	O36-C35	8.88	1.62	1.42
2	A	301	A1D88	O36-C35	8.83	1.62	1.42
2	E	301	A1D88	O36-C35	8.67	1.62	1.42
2	F	301	A1D88	O36-C35	8.59	1.61	1.42
2	D	301	A1D88	O36-C35	8.56	1.61	1.42
2	B	301	A1D88	O36-C35	8.33	1.61	1.42
2	E	301	A1D88	O36-C32	-6.35	1.30	1.45
2	C	301	A1D88	C34-C35	-6.35	1.33	1.53
2	C	301	A1D88	O36-C32	-6.33	1.30	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	301	A1D88	O36-C32	-6.30	1.31	1.45
2	D	301	A1D88	O36-C32	-6.22	1.31	1.45
2	B	301	A1D88	O36-C32	-6.15	1.31	1.45
2	A	301	A1D88	C34-C35	-6.14	1.34	1.53
2	F	301	A1D88	C34-C35	-6.13	1.34	1.53
2	E	301	A1D88	C34-C35	-6.13	1.34	1.53
2	D	301	A1D88	C34-C35	-6.06	1.34	1.53
2	B	301	A1D88	C34-C35	-6.03	1.34	1.53
2	A	301	A1D88	O36-C32	-5.98	1.31	1.45
2	C	301	A1D88	C10-N09	5.58	1.46	1.33
2	E	301	A1D88	C15-N14	5.39	1.46	1.33
2	E	301	A1D88	C10-N09	5.18	1.45	1.33
2	D	301	A1D88	C10-N09	5.15	1.45	1.33
2	C	301	A1D88	P27-O26	5.14	1.65	1.59
2	F	301	A1D88	C10-N09	5.12	1.45	1.33
2	C	301	A1D88	C15-N14	5.07	1.45	1.33
2	A	301	A1D88	C10-N09	4.97	1.45	1.33
2	C	301	A1D88	P23-O26	4.85	1.64	1.59
2	B	301	A1D88	C10-N09	4.63	1.44	1.33
2	C	301	A1D88	C41-N46	4.62	1.46	1.34
2	F	301	A1D88	C15-N14	4.51	1.44	1.33
2	A	301	A1D88	C41-N46	4.41	1.45	1.34
2	D	301	A1D88	C15-N14	4.30	1.43	1.33
2	F	301	A1D88	C41-N46	4.30	1.45	1.34
2	A	301	A1D88	O16-C15	-4.29	1.15	1.23
2	B	301	A1D88	C41-N46	4.25	1.45	1.34
2	E	301	A1D88	C41-N46	4.20	1.44	1.34
2	D	301	A1D88	C41-N46	4.18	1.44	1.34
2	B	301	A1D88	O16-C15	-4.14	1.15	1.23
2	B	301	A1D88	C15-N14	3.94	1.42	1.33
2	B	301	A1D88	P27-O26	3.88	1.63	1.59
2	E	301	A1D88	O16-C15	-3.81	1.16	1.23
2	B	301	A1D88	C40-N39	-3.75	1.32	1.39
2	A	301	A1D88	C40-N39	-3.67	1.32	1.39
2	E	301	A1D88	P27-O26	3.66	1.63	1.59
2	A	301	A1D88	C15-N14	3.50	1.41	1.33
2	F	301	A1D88	P27-O26	3.48	1.63	1.59
2	D	301	A1D88	C40-N39	-3.47	1.32	1.39
2	E	301	A1D88	C40-N39	-3.46	1.32	1.39
2	A	301	A1D88	P27-O26	3.43	1.63	1.59
2	D	301	A1D88	P27-O26	3.42	1.63	1.59
2	F	301	A1D88	C40-N39	-3.37	1.32	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	F	301	A1D88	O16-C15	-3.32	1.17	1.23
2	D	301	A1D88	O16-C15	-3.29	1.17	1.23
2	D	301	A1D88	O05-C04	-3.27	1.15	1.21
2	A	301	A1D88	P23-O26	3.18	1.62	1.59
2	F	301	A1D88	C45-N37	-3.08	1.31	1.37
2	A	301	A1D88	O05-C04	-3.05	1.16	1.21
2	E	301	A1D88	O05-C04	-2.90	1.16	1.21
2	D	301	A1D88	C45-N37	-2.89	1.31	1.37
2	B	301	A1D88	C45-N37	-2.86	1.31	1.37
2	E	301	A1D88	C45-N37	-2.84	1.31	1.37
2	E	301	A1D88	P23-O26	2.83	1.62	1.59
2	F	301	A1D88	O05-C04	-2.80	1.16	1.21
2	B	301	A1D88	O11-C10	-2.71	1.17	1.23
2	A	301	A1D88	C45-N37	-2.70	1.32	1.37
2	B	301	A1D88	O05-C04	-2.66	1.17	1.21
2	A	301	A1D88	C38-N37	-2.64	1.33	1.37
2	C	301	A1D88	P49-O48	2.61	1.64	1.59
2	B	301	A1D88	C38-N37	-2.60	1.33	1.37
2	C	301	A1D88	C38-N37	-2.57	1.33	1.37
2	B	301	A1D88	P23-O26	2.55	1.62	1.59
2	F	301	A1D88	C38-N37	-2.55	1.33	1.37
2	C	301	A1D88	C40-N39	-2.52	1.34	1.39
2	D	301	A1D88	P23-O26	2.50	1.62	1.59
2	D	301	A1D88	P49-O48	2.49	1.63	1.59
2	D	301	A1D88	C38-N37	-2.46	1.33	1.37
2	E	301	A1D88	C38-N37	-2.45	1.33	1.37
2	F	301	A1D88	P23-O26	2.45	1.62	1.59
2	C	301	A1D88	C45-N37	-2.35	1.32	1.37
2	C	301	A1D88	O05-C04	-2.34	1.17	1.21
2	B	301	A1D88	P49-O48	2.31	1.63	1.59
2	B	301	A1D88	C12-C10	2.28	1.55	1.51
2	A	301	A1D88	P49-O48	2.28	1.63	1.59
2	E	301	A1D88	P49-O48	2.27	1.63	1.59
2	F	301	A1D88	C41-N42	-2.25	1.29	1.35
2	C	301	A1D88	O11-C10	-2.21	1.18	1.23
2	C	301	A1D88	O16-C15	-2.20	1.19	1.23
2	F	301	A1D88	P49-O48	2.19	1.63	1.59
2	C	301	A1D88	C33-C32	2.17	1.58	1.52
2	D	301	A1D88	C41-N42	-2.16	1.29	1.35
2	D	301	A1D88	O53-C17	-2.14	1.38	1.42
2	A	301	A1D88	C41-N42	-2.13	1.29	1.35
2	B	301	A1D88	C41-N42	-2.11	1.29	1.35

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	301	A1D88	C41-N42	-2.09	1.29	1.35
2	A	301	A1D88	O53-C17	-2.05	1.38	1.42
2	E	301	A1D88	O11-C10	-2.04	1.19	1.23
2	D	301	A1D88	C33-C32	2.02	1.58	1.52
2	B	301	A1D88	C08-N09	-2.02	1.41	1.46
2	F	301	A1D88	O47-C34	-2.01	1.38	1.43

All (128) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	301	A1D88	C13-N14-C15	-9.06	106.27	122.55
2	A	301	A1D88	C13-N14-C15	-8.90	106.56	122.55
2	B	301	A1D88	C17-C15-N14	8.64	132.88	116.48
2	B	301	A1D88	C07-C08-N09	-8.29	95.11	112.41
2	E	301	A1D88	C07-S06-C04	6.80	107.87	99.85
2	A	301	A1D88	C07-S06-C04	6.79	107.85	99.85
2	B	301	A1D88	O16-C15-N14	-6.67	108.88	122.98
2	F	301	A1D88	C07-S06-C04	6.65	107.69	99.85
2	A	301	A1D88	C17-C15-N14	6.20	128.24	116.48
2	D	301	A1D88	C07-S06-C04	5.88	106.78	99.85
2	B	301	A1D88	O11-C10-N09	-5.73	111.78	123.03
2	A	301	A1D88	C13-C12-C10	-5.52	103.19	112.39
2	D	301	A1D88	N44-C43-N42	-5.51	120.24	128.58
2	E	301	A1D88	N44-C43-N42	-5.49	120.27	128.58
2	D	301	A1D88	C01-C02-C03	-5.24	114.74	125.28
2	A	301	A1D88	N44-C43-N42	-4.98	121.05	128.58
2	B	301	A1D88	N44-C43-N42	-4.72	121.43	128.58
2	F	301	A1D88	N44-C43-N42	-4.59	121.64	128.58
2	C	301	A1D88	C07-S06-C04	4.58	105.24	99.85
2	A	301	A1D88	C08-N09-C10	-4.53	114.40	122.82
2	A	301	A1D88	C19-C18-C17	4.34	116.17	108.77
2	C	301	A1D88	C40-C45-N44	-4.34	120.75	126.72
2	D	301	A1D88	C19-C18-C21	-4.19	101.31	108.22
2	B	301	A1D88	C40-C45-N44	-4.08	121.11	126.72
2	A	301	A1D88	C40-C45-N44	-4.03	121.16	126.72
2	A	301	A1D88	O16-C15-N14	-4.00	114.51	122.98
2	F	301	A1D88	C13-C12-C10	-3.98	105.76	112.39
2	B	301	A1D88	N37-C38-N39	-3.97	108.31	113.94
2	F	301	A1D88	C08-N09-C10	-3.78	115.78	122.82
2	B	301	A1D88	C40-N39-C38	3.78	109.39	103.45
2	C	301	A1D88	N44-C43-N42	-3.75	122.91	128.58
2	E	301	A1D88	C40-C45-N44	-3.71	121.61	126.72

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	D	301	A1D88	C40-C45-N44	-3.69	121.63	126.72
2	F	301	A1D88	O29-P27-O26	3.58	116.94	107.27
2	A	301	A1D88	C01-C02-C03	-3.53	118.18	125.28
2	F	301	A1D88	C40-C45-N44	-3.52	121.86	126.72
2	E	301	A1D88	C13-N14-C15	3.45	128.74	122.55
2	B	301	A1D88	C45-C40-N39	-3.43	106.66	110.58
2	D	301	A1D88	C08-N09-C10	-3.42	116.45	122.82
2	E	301	A1D88	C43-N42-C41	3.42	124.35	118.73
2	E	301	A1D88	C01-C02-C03	-3.35	118.55	125.28
2	A	301	A1D88	N37-C38-N39	-3.32	109.22	113.94
2	E	301	A1D88	C20-C18-C21	-3.31	102.75	108.22
2	B	301	A1D88	C12-C10-N09	3.30	122.36	116.34
2	B	301	A1D88	C45-N37-C38	3.30	109.20	105.74
2	B	301	A1D88	O29-P27-O26	3.29	116.18	107.27
2	A	301	A1D88	C40-N39-C38	3.28	108.61	103.45
2	D	301	A1D88	C43-N42-C41	3.27	124.09	118.73
2	A	301	A1D88	N44-C45-N37	3.25	132.69	127.17
2	B	301	A1D88	C19-C18-C21	-3.24	102.88	108.22
2	F	301	A1D88	C01-C02-C03	-3.21	118.82	125.28
2	C	301	A1D88	C45-C40-N39	-3.21	106.91	110.58
2	E	301	A1D88	O36-C35-C34	-3.19	99.79	106.62
2	D	301	A1D88	N37-C38-N39	-3.19	109.41	113.94
2	A	301	A1D88	C43-N42-C41	3.18	123.96	118.73
2	F	301	A1D88	N37-C38-N39	-3.16	109.45	113.94
2	C	301	A1D88	C13-N14-C15	-3.16	116.87	122.55
2	B	301	A1D88	N44-C45-N37	3.12	132.47	127.17
2	E	301	A1D88	C43-N44-C45	3.11	119.44	111.83
2	D	301	A1D88	C43-N44-C45	3.10	119.41	111.83
2	F	301	A1D88	C43-N42-C41	3.07	123.78	118.73
2	D	301	A1D88	O29-P27-O26	3.02	115.43	107.27
2	F	301	A1D88	C45-N37-C38	3.00	108.89	105.74
2	B	301	A1D88	C02-C03-C04	-2.99	114.41	123.70
2	A	301	A1D88	C45-C40-N39	-2.99	107.17	110.58
2	A	301	A1D88	C45-N37-C38	2.96	108.84	105.74
2	B	301	A1D88	C43-N44-C45	2.94	119.00	111.83
2	C	301	A1D88	C43-N44-C45	2.93	118.98	111.83
2	A	301	A1D88	C43-N44-C45	2.91	118.93	111.83
2	D	301	A1D88	C45-N37-C38	2.90	108.78	105.74
2	B	301	A1D88	C19-C18-C17	2.90	113.71	108.77
2	D	301	A1D88	C40-N39-C38	2.90	108.00	103.45
2	D	301	A1D88	N44-C45-N37	2.89	132.08	127.17
2	F	301	A1D88	C40-N39-C38	2.88	107.97	103.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	E	301	A1D88	N37-C38-N39	-2.87	109.86	113.94
2	C	301	A1D88	N44-C45-N37	2.87	132.04	127.17
2	F	301	A1D88	C45-C40-N39	-2.87	107.30	110.58
2	E	301	A1D88	N44-C45-N37	2.86	132.03	127.17
2	E	301	A1D88	C08-N09-C10	-2.81	117.59	122.82
2	B	301	A1D88	C12-C13-N14	2.79	117.93	112.00
2	B	301	A1D88	C43-N42-C41	2.74	123.23	118.73
2	E	301	A1D88	C40-N39-C38	2.71	107.71	103.45
2	C	301	A1D88	C12-C10-N09	2.71	121.28	116.34
2	F	301	A1D88	N44-C45-N37	2.69	131.75	127.17
2	D	301	A1D88	C45-C40-N39	-2.68	107.51	110.58
2	C	301	A1D88	C08-N09-C10	-2.68	117.84	122.82
2	C	301	A1D88	C07-C08-N09	-2.67	106.83	112.41
2	A	301	A1D88	C19-C18-C21	2.67	112.63	108.22
2	E	301	A1D88	C45-C40-N39	-2.64	107.56	110.58
2	E	301	A1D88	O29-P27-O26	2.63	114.39	107.27
2	F	301	A1D88	C43-N44-C45	2.63	118.25	111.83
2	E	301	A1D88	C45-N37-C38	2.63	108.50	105.74
2	D	301	A1D88	C13-C12-C10	-2.63	108.02	112.39
2	C	301	A1D88	N37-C38-N39	-2.61	110.23	113.94
2	E	301	A1D88	C13-C12-C10	2.60	116.73	112.39
2	D	301	A1D88	O36-C35-C34	-2.60	101.05	106.62
2	E	301	A1D88	C34-C35-N37	-2.58	106.89	113.30
2	D	301	A1D88	C13-N14-C15	-2.58	117.91	122.55
2	A	301	A1D88	O53-C17-C15	-2.55	98.75	109.38
2	C	301	A1D88	C40-N39-C38	2.54	107.44	103.45
2	D	301	A1D88	C20-C18-C17	2.51	113.05	108.77
2	E	301	A1D88	C19-C18-C21	2.49	112.33	108.22
2	D	301	A1D88	C17-C15-N14	2.42	121.08	116.48
2	B	301	A1D88	O36-C35-C34	-2.41	101.45	106.62
2	C	301	A1D88	C02-C03-C04	-2.36	116.37	123.70
2	F	301	A1D88	C17-C15-N14	2.35	120.94	116.48
2	A	301	A1D88	C20-C18-C21	-2.35	104.35	108.22
2	C	301	A1D88	C45-N37-C38	2.35	108.20	105.74
2	C	301	A1D88	C17-C15-N14	2.33	120.90	116.48
2	C	301	A1D88	C01-C02-C03	-2.32	120.61	125.28
2	F	301	A1D88	O36-C35-C34	-2.32	101.64	106.62
2	B	301	A1D88	O05-C04-S06	-2.32	117.59	122.44
2	C	301	A1D88	C34-C35-N37	-2.30	107.58	113.30
2	A	301	A1D88	O36-C35-C34	-2.26	101.78	106.62
2	A	301	A1D88	O05-C04-S06	-2.25	117.74	122.44
2	B	301	A1D88	C07-S06-C04	2.25	102.50	99.85

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	F	301	A1D88	C20-C18-C17	2.22	112.55	108.77
2	F	301	A1D88	C02-C03-C04	-2.17	116.96	123.70
2	E	301	A1D88	O05-C04-S06	-2.17	117.92	122.44
2	A	301	A1D88	C34-C35-N37	-2.16	107.93	113.30
2	A	301	A1D88	C02-C03-C04	-2.16	117.00	123.70
2	B	301	A1D88	O53-C17-C18	-2.16	105.18	110.18
2	F	301	A1D88	O05-C04-S06	-2.14	117.98	122.44
2	E	301	A1D88	C12-C10-N09	2.13	120.23	116.34
2	B	301	A1D88	O11-C10-C12	2.12	125.85	122.02
2	E	301	A1D88	O16-C15-C17	-2.08	115.09	120.89
2	D	301	A1D88	C20-C18-C21	2.05	111.60	108.22
2	C	301	A1D88	O05-C04-S06	-2.03	118.21	122.44

There are no chirality outliers.

All (68) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	301	A1D88	C21-O22-P23-O26
2	A	301	A1D88	C02-C03-C04-S06
2	A	301	A1D88	C10-C12-C13-N14
2	A	301	A1D88	O30-C31-C32-O36
2	B	301	A1D88	C10-C12-C13-N14
2	B	301	A1D88	C15-C17-C18-C19
2	B	301	A1D88	C15-C17-C18-C20
2	B	301	A1D88	C15-C17-C18-C21
2	B	301	A1D88	O53-C17-C18-C19
2	B	301	A1D88	O53-C17-C18-C21
2	C	301	A1D88	C31-O30-P27-O26
2	C	301	A1D88	C31-O30-P27-O28
2	C	301	A1D88	C31-O30-P27-O29
2	C	301	A1D88	S06-C07-C08-N09
2	C	301	A1D88	C10-C12-C13-N14
2	C	301	A1D88	N14-C15-C17-O53
2	C	301	A1D88	O16-C15-C17-C18
2	C	301	A1D88	C15-C17-C18-C19
2	C	301	A1D88	C15-C17-C18-C20
2	C	301	A1D88	C15-C17-C18-C21
2	C	301	A1D88	O53-C17-C18-C19
2	C	301	A1D88	O53-C17-C18-C20
2	C	301	A1D88	O53-C17-C18-C21
2	D	301	A1D88	C21-O22-P23-O24
2	D	301	A1D88	C21-O22-P23-O26

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Mol	Chain	Res	Type	Atoms
2	D	301	A1D88	C02-C03-C04-S06
2	E	301	A1D88	C21-O22-P23-O24
2	E	301	A1D88	C21-O22-P23-O26
2	E	301	A1D88	C02-C03-C04-S06
2	E	301	A1D88	N14-C15-C17-O53
2	F	301	A1D88	C02-C03-C04-S06
2	E	301	A1D88	C12-C13-N14-C15
2	B	301	A1D88	C12-C10-N09-C08
2	B	301	A1D88	O11-C10-N09-C08
2	A	301	A1D88	O30-C31-C32-C33
2	A	301	A1D88	C02-C03-C04-O05
2	D	301	A1D88	C02-C03-C04-O05
2	F	301	A1D88	C02-C03-C04-O05
2	C	301	A1D88	O16-C15-C17-O53
2	B	301	A1D88	O53-C17-C18-C20
2	E	301	A1D88	P23-O26-P27-O28
2	C	301	A1D88	N14-C15-C17-C18
2	A	301	A1D88	P27-O26-P23-O22
2	C	301	A1D88	P23-O26-P27-O30
2	D	301	A1D88	P27-O26-P23-O22
2	F	301	A1D88	C19-C18-C21-O22
2	C	301	A1D88	C08-C07-S06-C04
2	F	301	A1D88	C17-C18-C21-O22
2	A	301	A1D88	C21-O22-P23-O24
2	B	301	A1D88	C21-O22-P23-O24
2	B	301	A1D88	C31-O30-P27-O29
2	D	301	A1D88	C31-O30-P27-O29
2	E	301	A1D88	C31-O30-P27-O29
2	F	301	A1D88	C31-O30-P27-O29
2	D	301	A1D88	P23-O26-P27-O28
2	F	301	A1D88	P23-O26-P27-O29
2	A	301	A1D88	S06-C07-C08-N09
2	E	301	A1D88	C02-C03-C04-O05
2	F	301	A1D88	P23-O26-P27-O28
2	C	301	A1D88	C32-C31-O30-P27
2	A	301	A1D88	C15-C17-C18-C19
2	E	301	A1D88	O11-C10-C12-C13
2	A	301	A1D88	C20-C18-C21-O22
2	E	301	A1D88	N09-C10-C12-C13
2	C	301	A1D88	C33-O48-P49-O52
2	F	301	A1D88	N14-C15-C17-O53
2	A	301	A1D88	C17-C18-C21-O22

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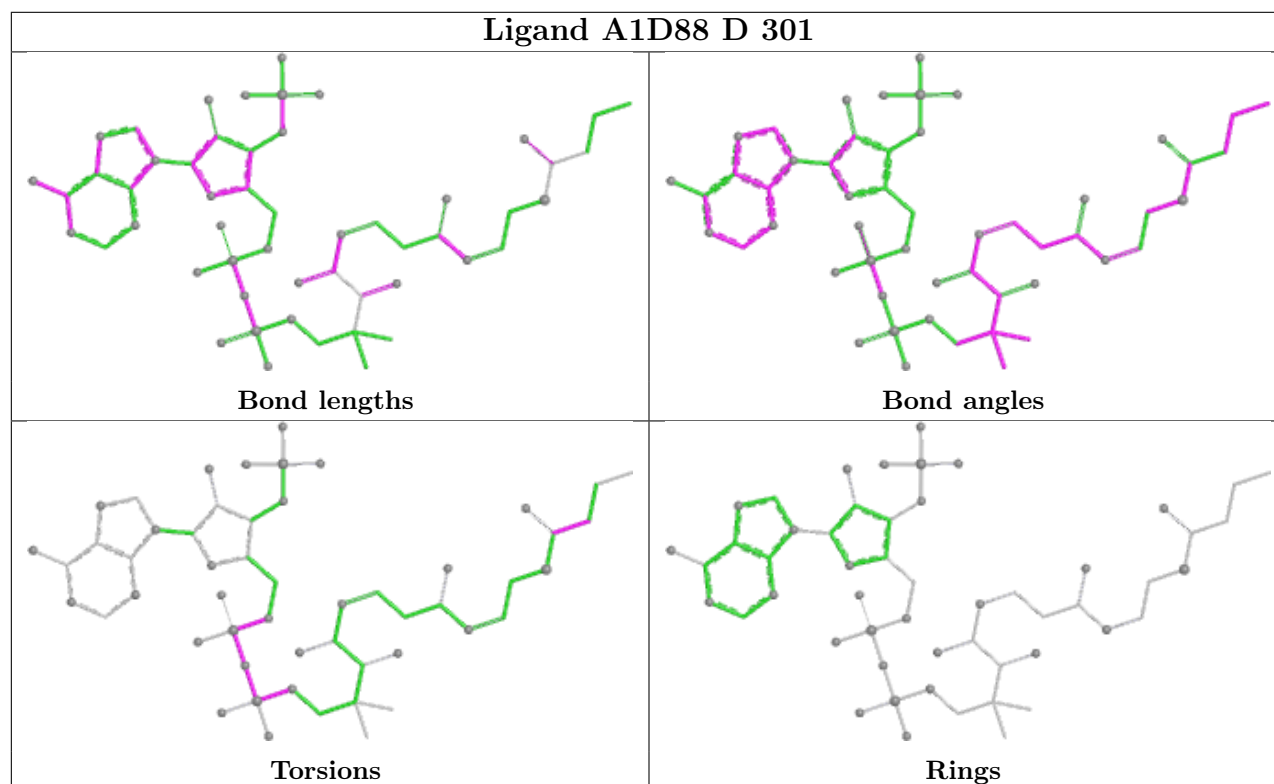
Mol	Chain	Res	Type	Atoms
2	B	301	A1D88	P23-O26-P27-O29

There are no ring outliers.

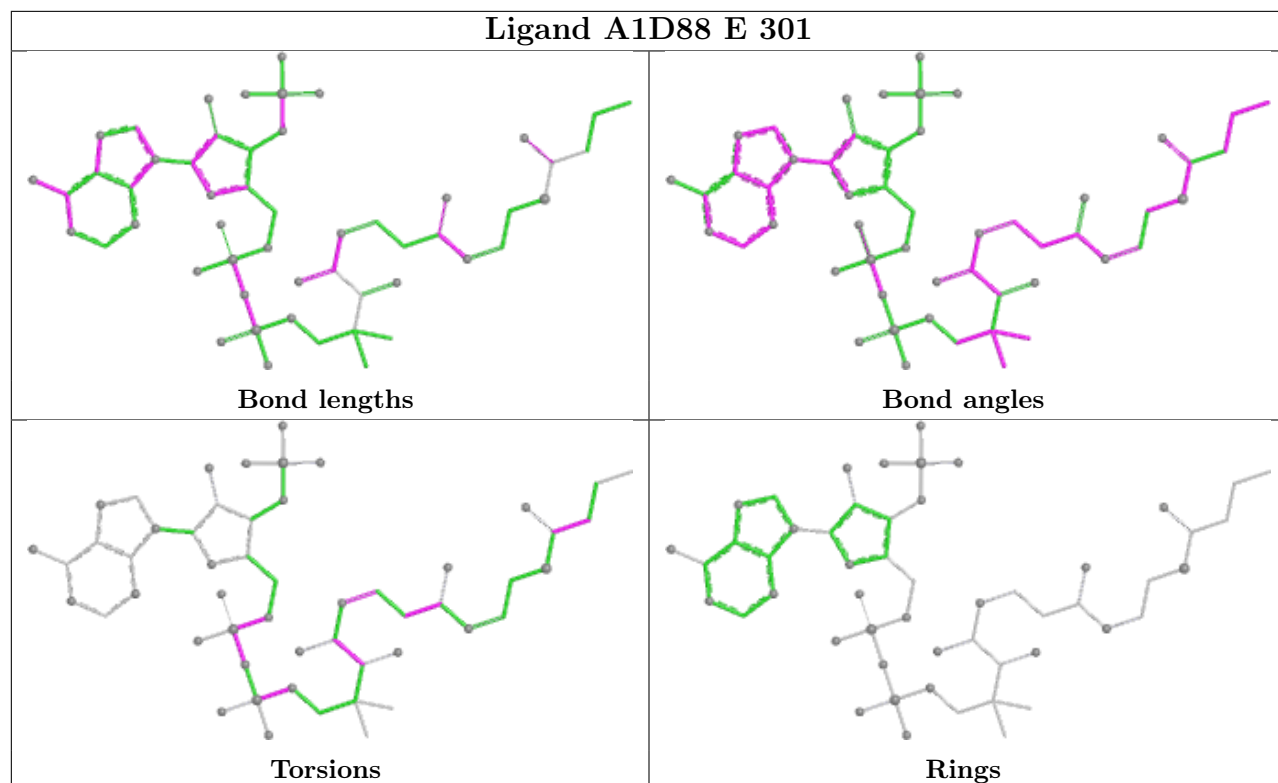
1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	301	A1D88	1	0

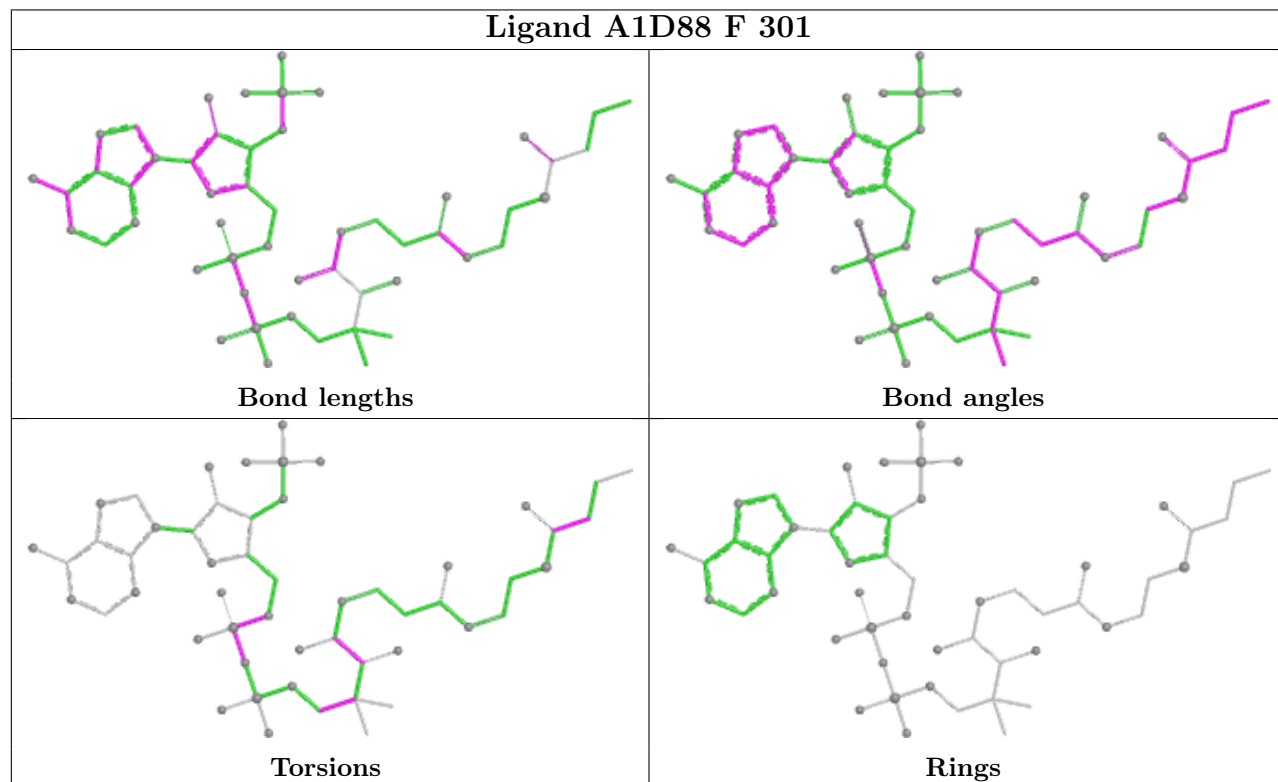
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. 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.



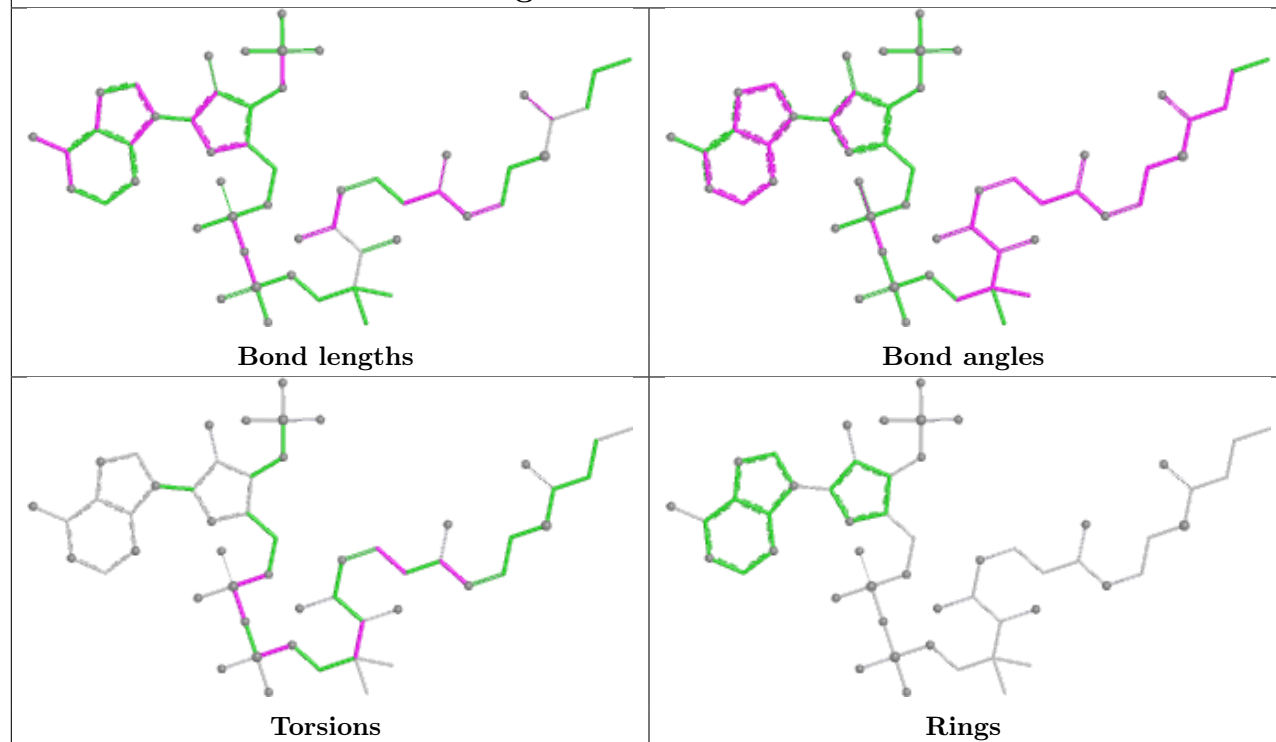
Ligand A1D88 E 301



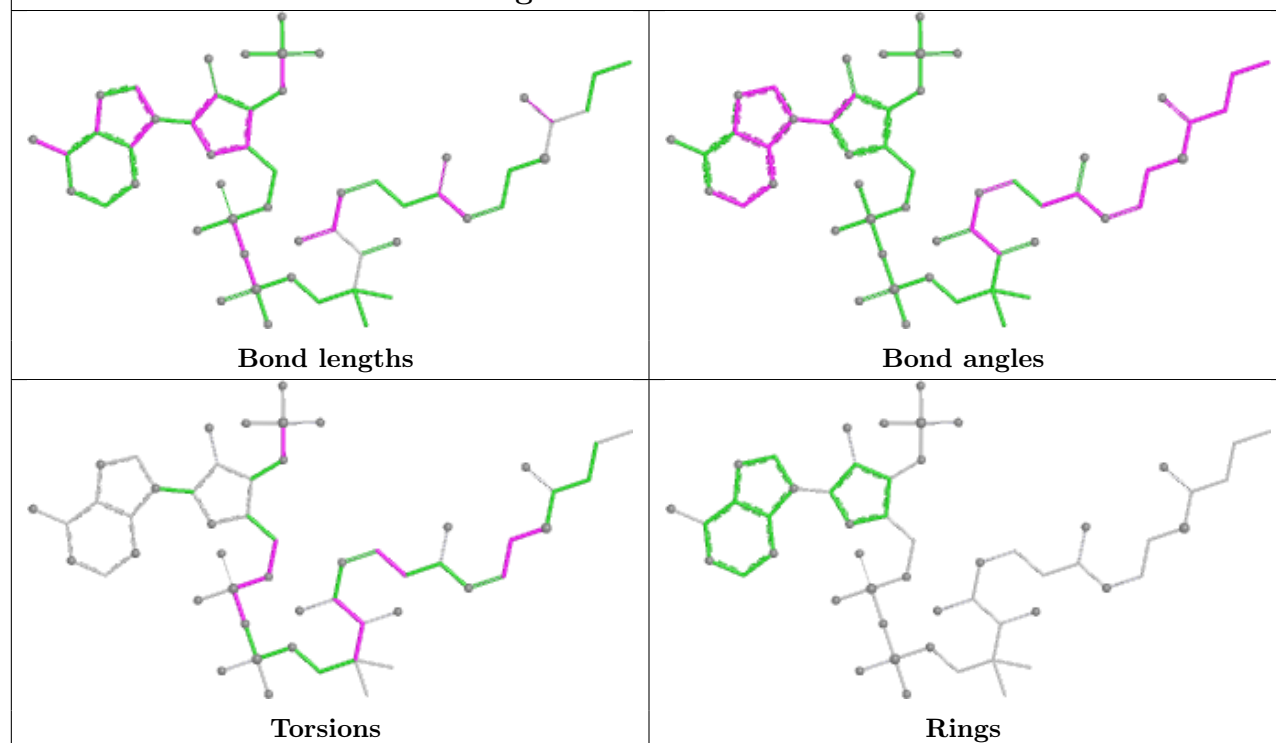
Ligand A1D88 F 301

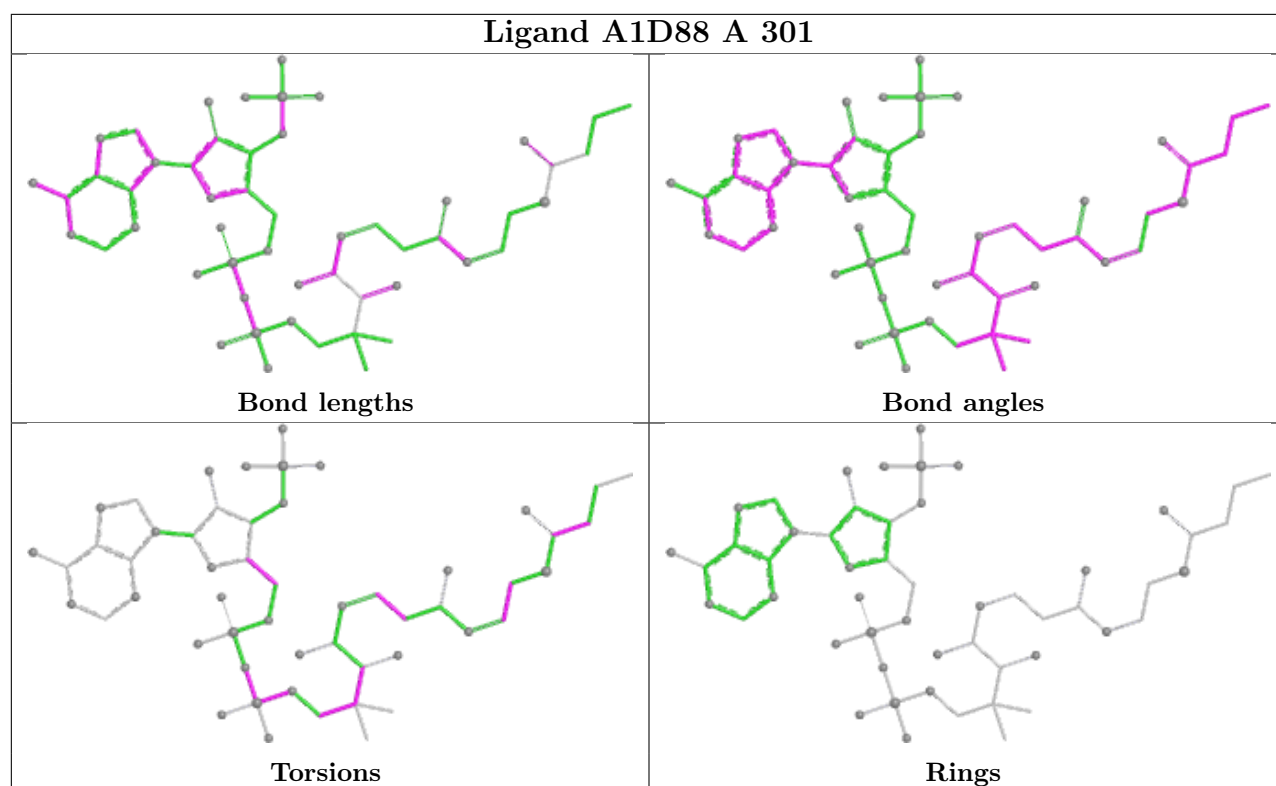


Ligand A1D88 B 301



Ligand A1D88 C 301





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.

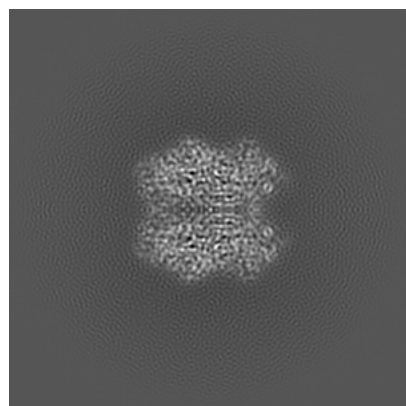
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-60409. These allow visual inspection of the internal detail of the map and identification of artifacts.

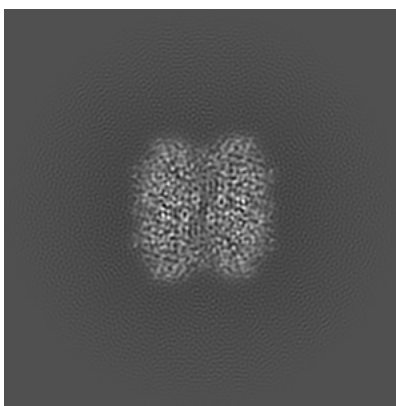
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

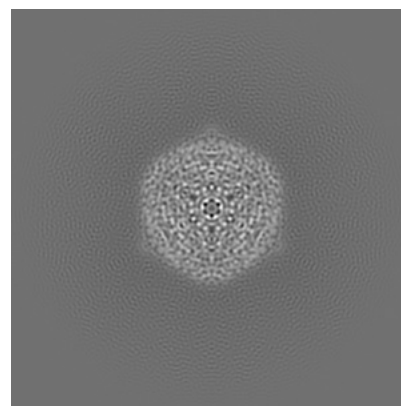
6.1.1 Primary map



X

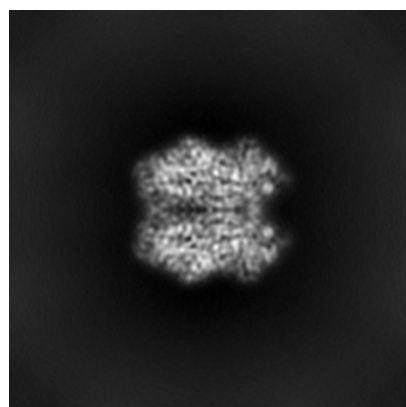


Y

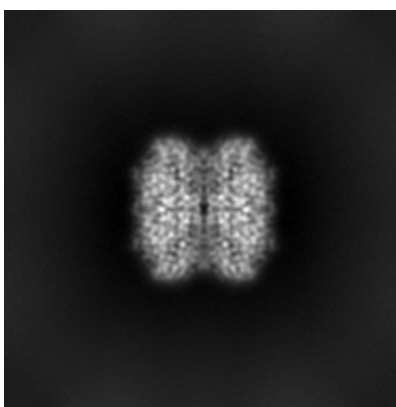


Z

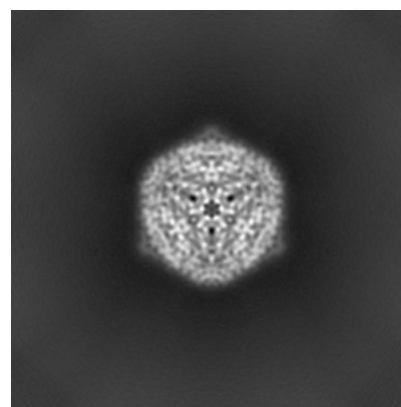
6.1.2 Raw map



X



Y

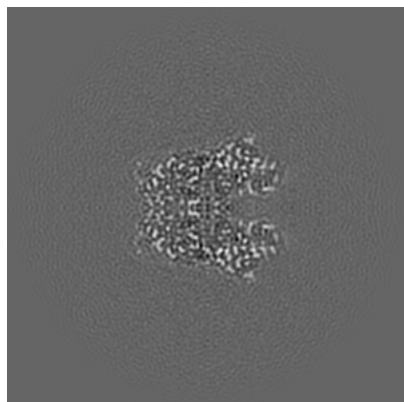


Z

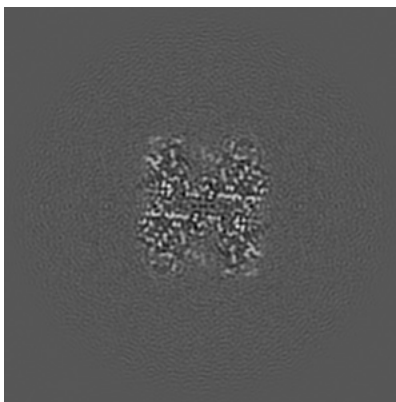
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

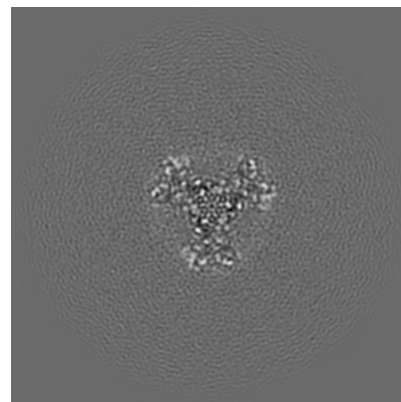
6.2.1 Primary map



X Index: 128

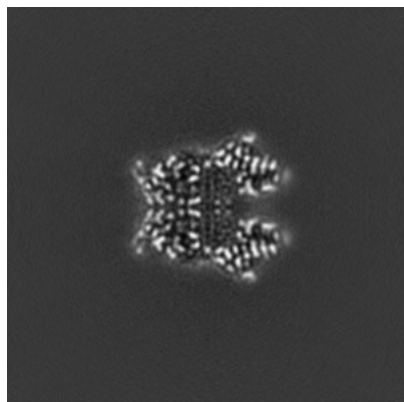


Y Index: 128

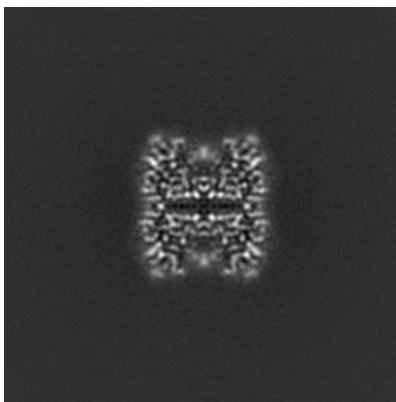


Z Index: 128

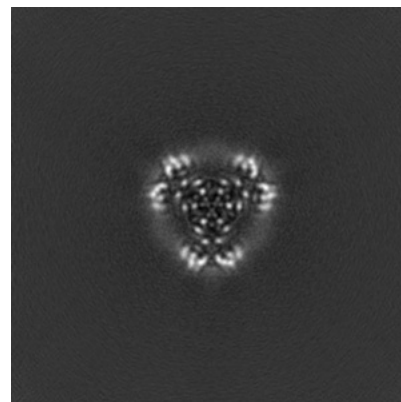
6.2.2 Raw map



X Index: 128



Y Index: 128

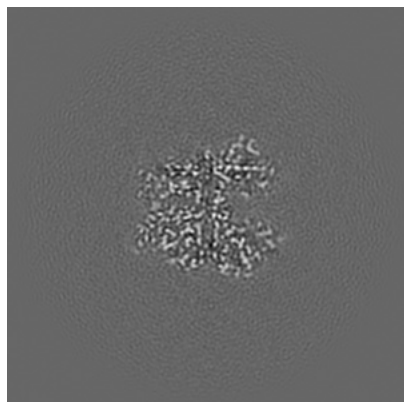


Z Index: 128

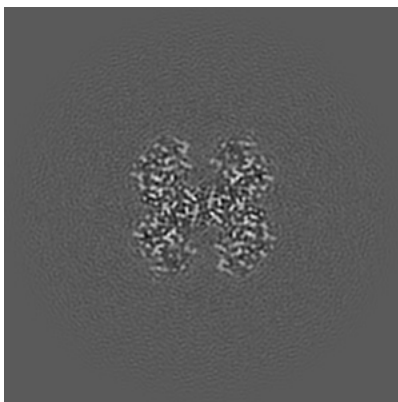
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

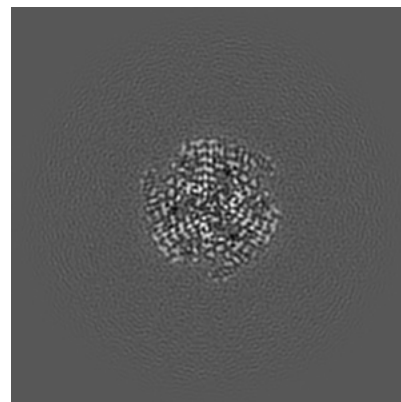
6.3.1 Primary map



X Index: 132

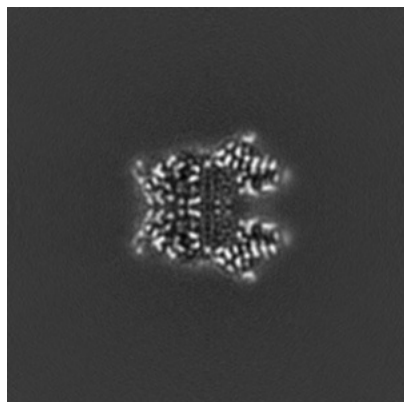


Y Index: 121

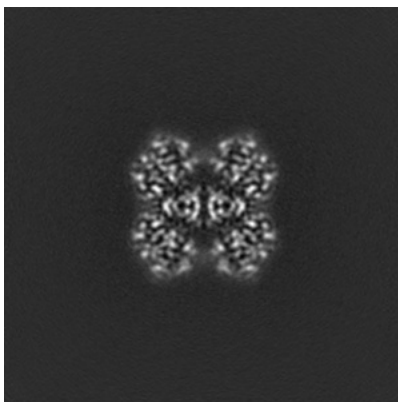


Z Index: 101

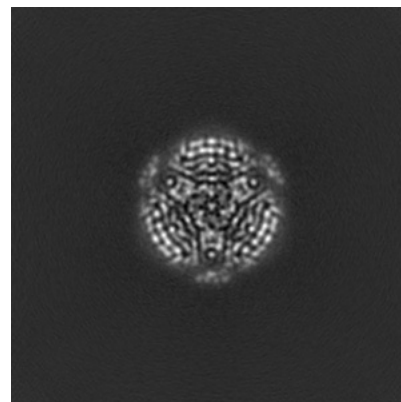
6.3.2 Raw map



X Index: 128



Y Index: 121

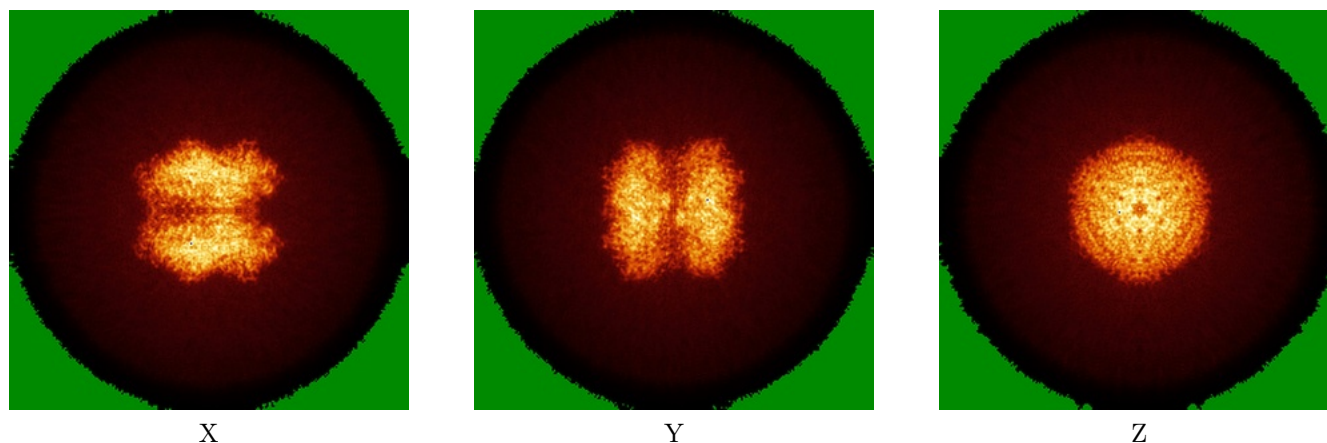


Z Index: 154

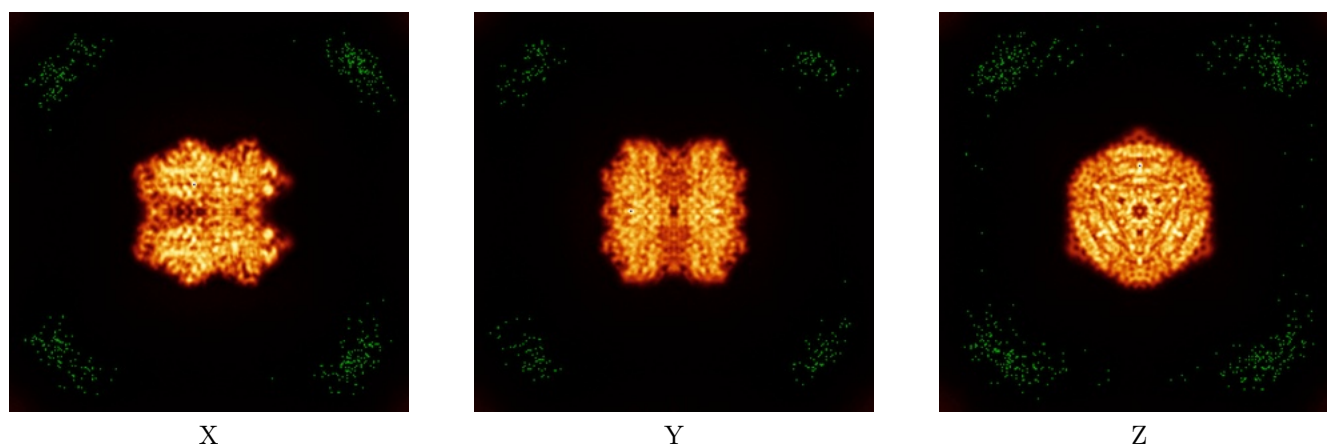
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



6.4.2 Raw map



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](#)

This section was not generated.

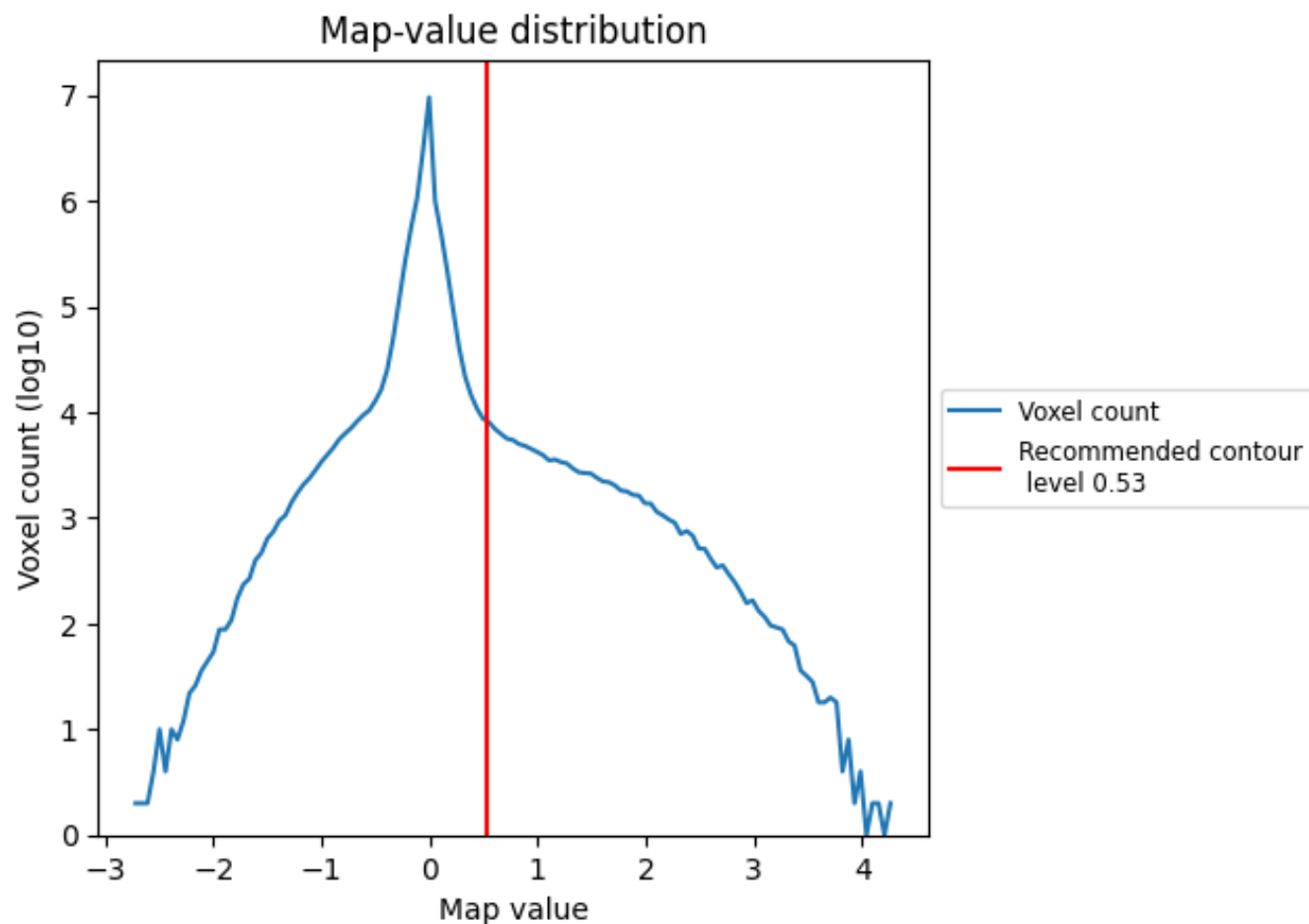
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

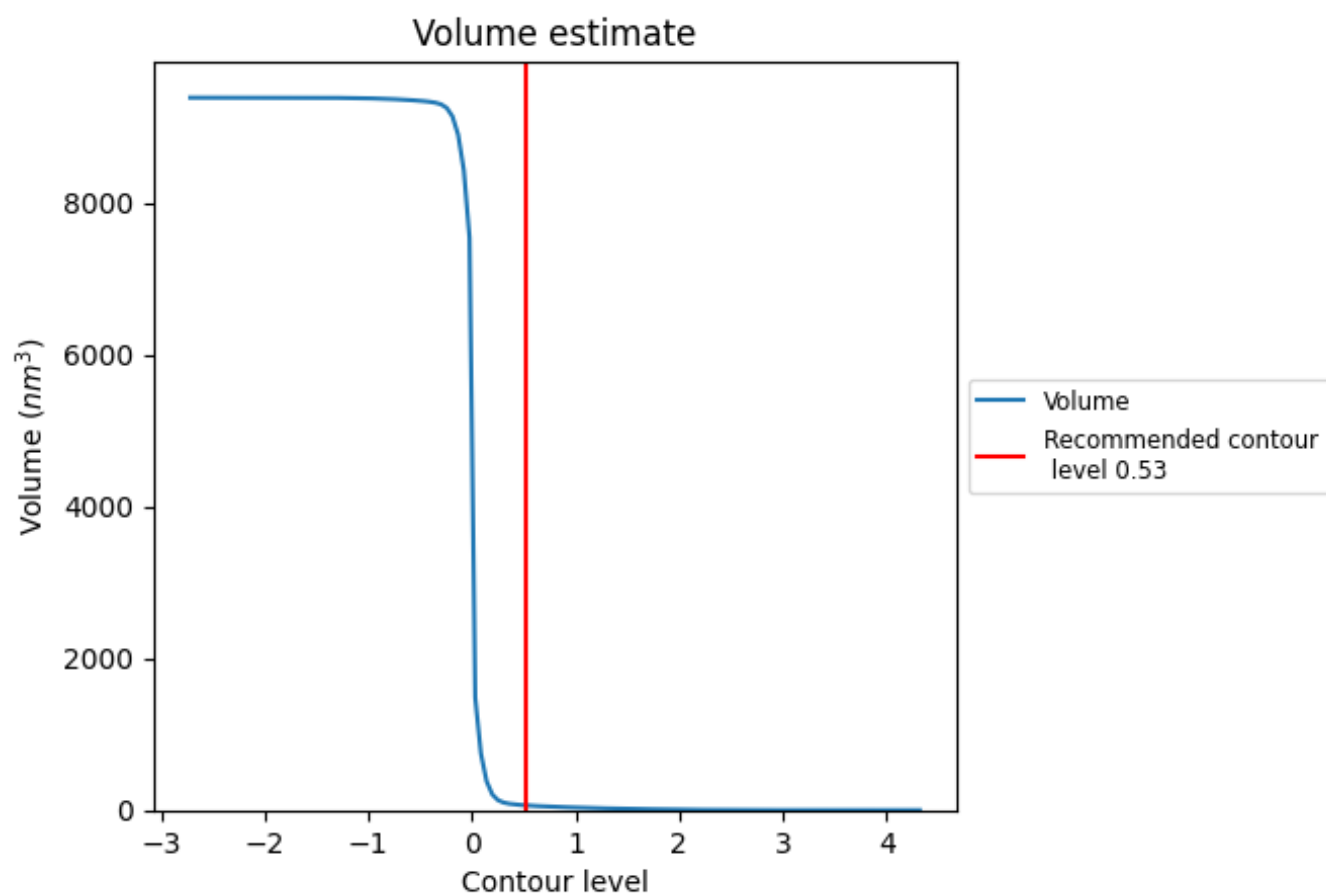
This section contains the results of statistical analysis of the map.

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.

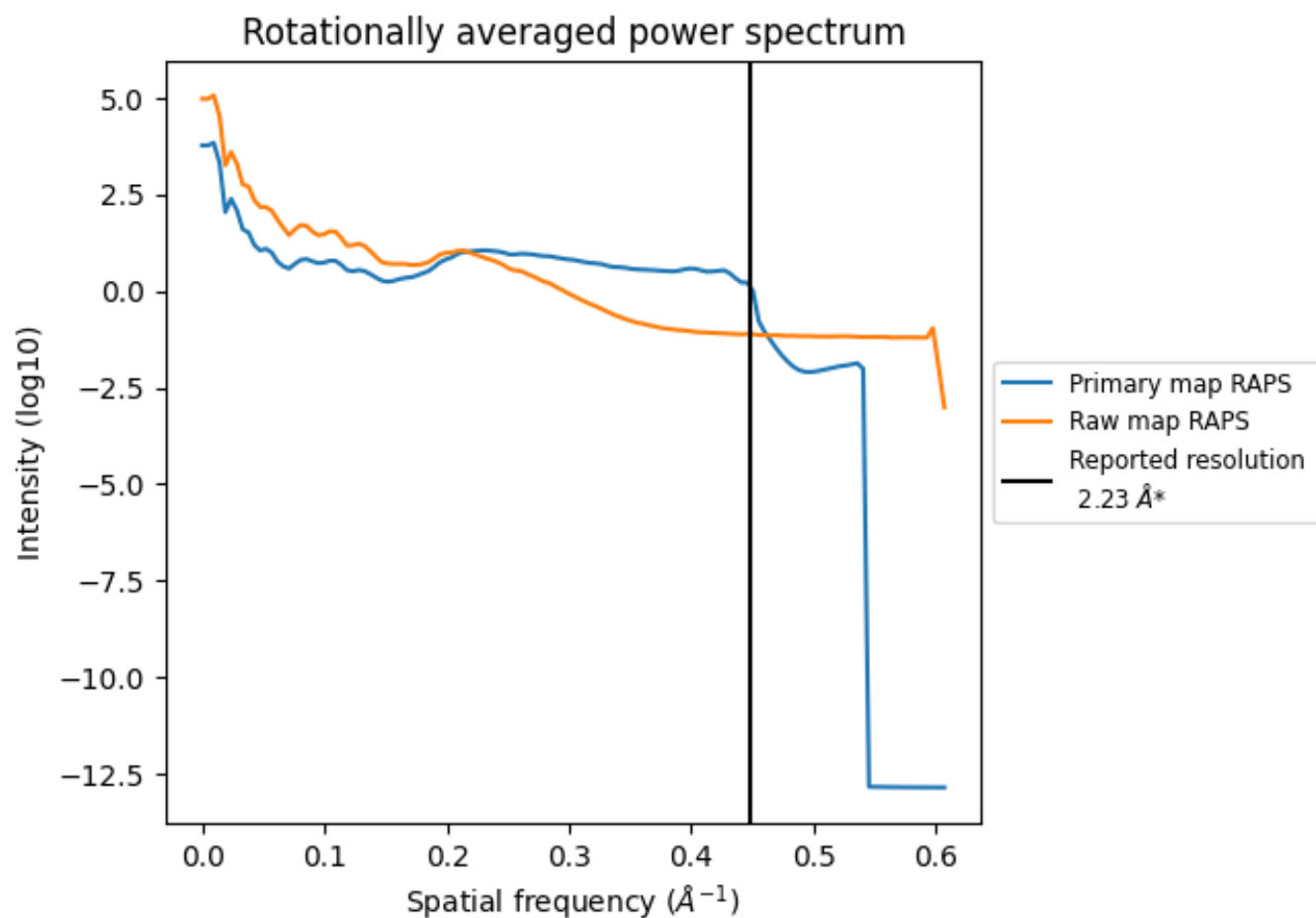
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 62 nm^3 ; this corresponds to an approximate mass of 56 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 ⓘ

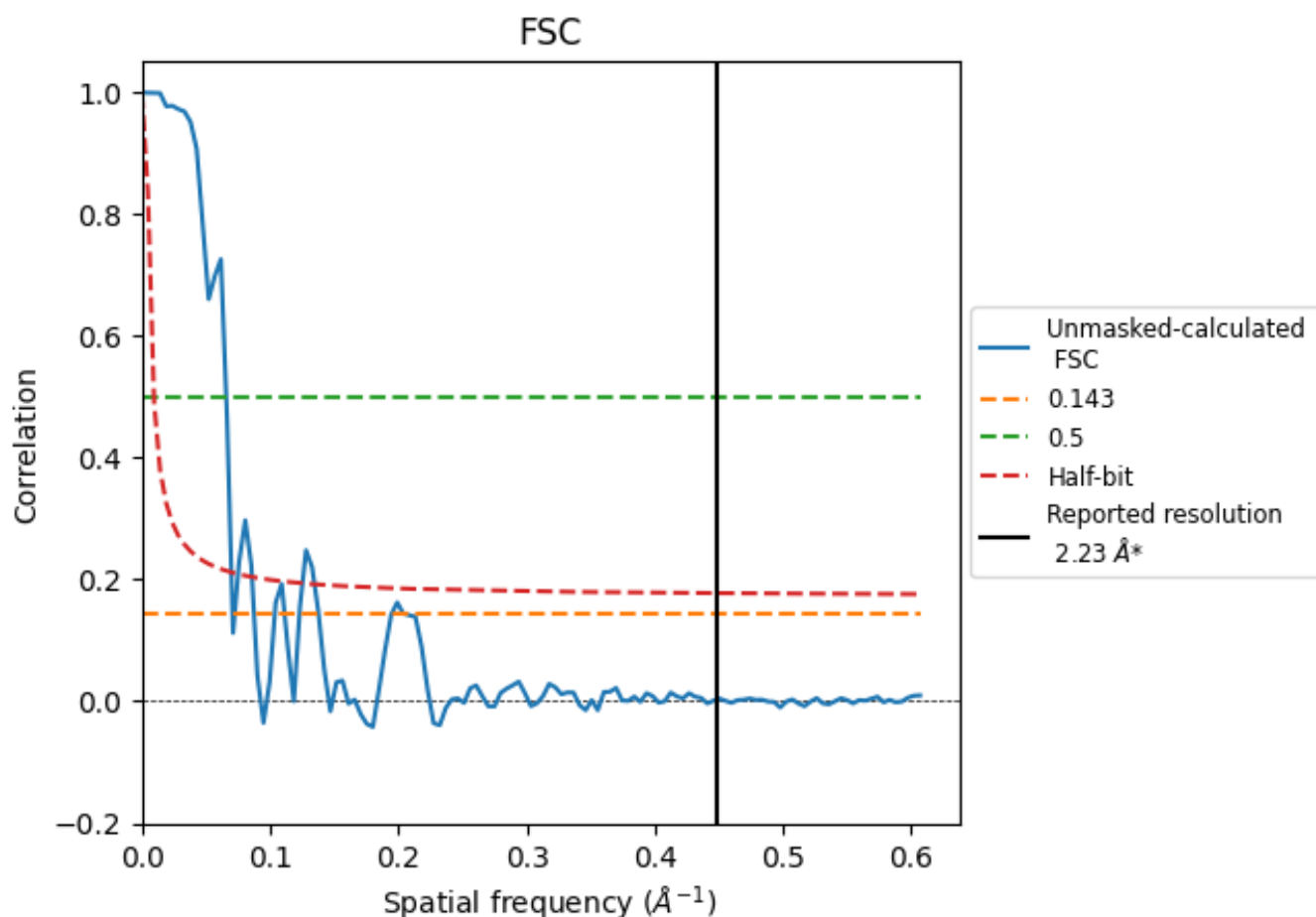


*Reported resolution corresponds to spatial frequency of 0.448 Å⁻¹

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 0.448 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

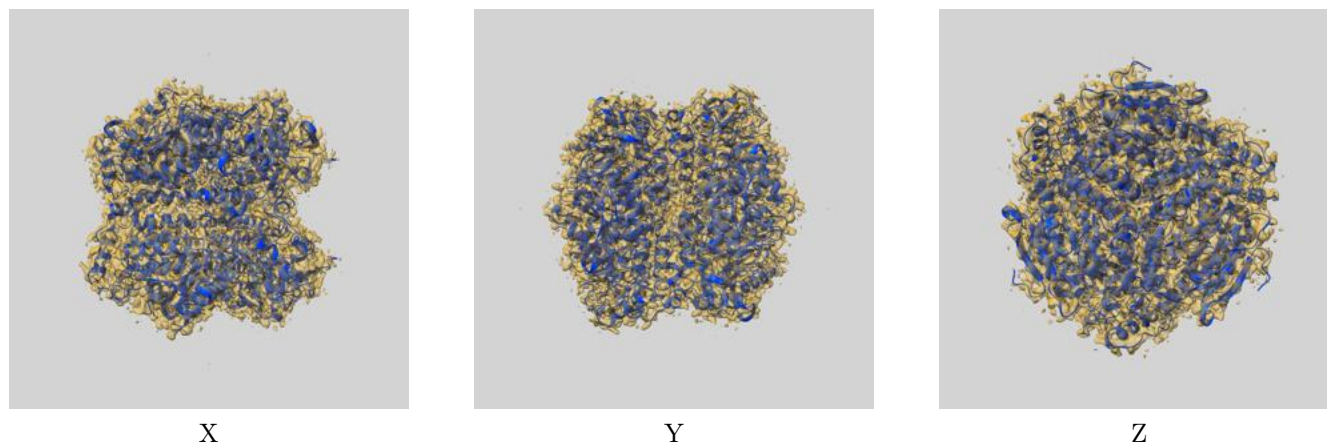
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.23	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	14.14	15.22	14.33

*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 14.14 differs from the reported value 2.23 by more than 10 %

9 Map-model fit [i](#)

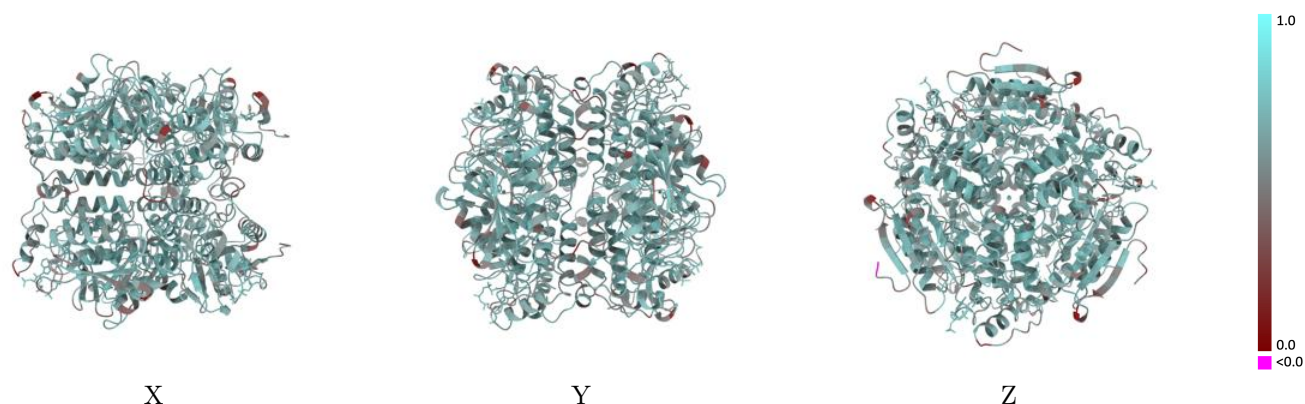
This section contains information regarding the fit between EMDB map EMD-60409 and PDB model 8ZRY. Per-residue inclusion information can be found in section [3](#) on page [6](#).

9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.53 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](#)

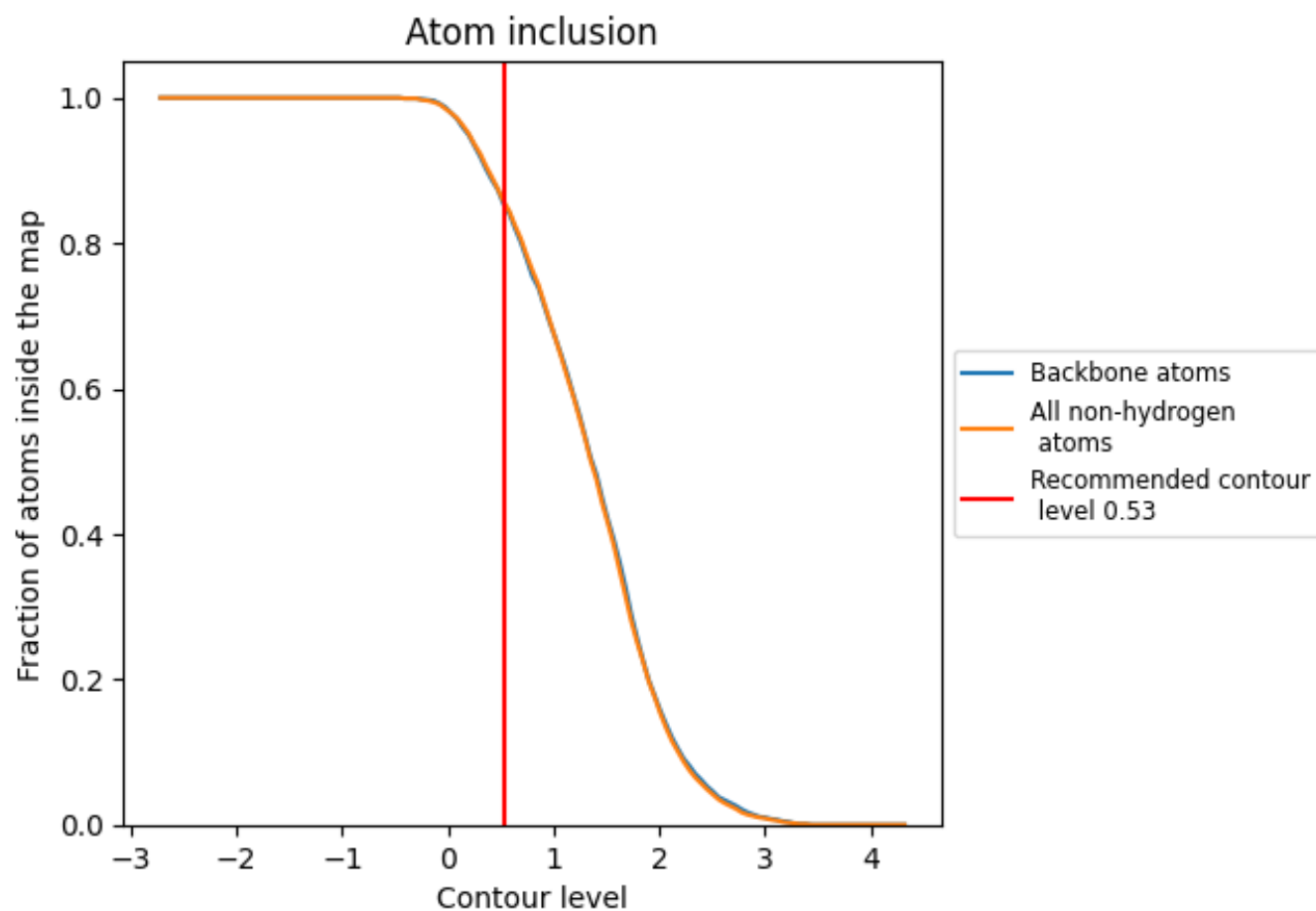


The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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, 85% of all backbone atoms, 86% 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 (0.53) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8570	0.6140
A	0.8660	0.6160
B	0.8590	0.6130
C	0.8560	0.6090
D	0.8550	0.6110
E	0.8680	0.6170
F	0.8730	0.6160

