



Full wwPDB EM Validation Report ⓘ

Oct 6, 2025 – 01:24 PM EDT

PDB ID : 9MPQ / pdb_00009mpq
EMDB ID : EMD-48499
Title : Cryo-EM structure of VCP (consensus)
Authors : Shah, B.; Hunkeler, M.; Buhrlage, S.J.; Fischer, E.S.
Deposited on : 2024-12-31
Resolution : 2.30 Å (reported)
Based on initial model : 5FTK

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:

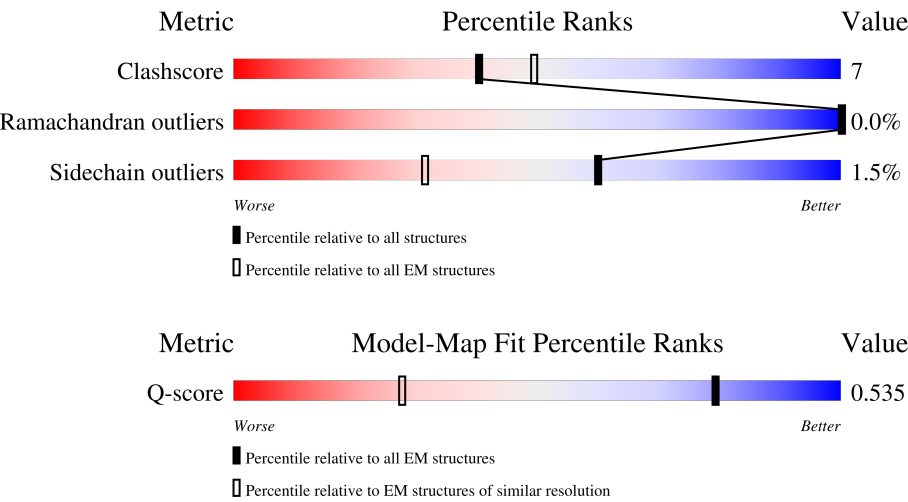
EMDB validation analysis : 0.0.1.dev129
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.46

1 Overall quality at a glance i

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

The reported resolution of this entry is 2.30 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	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	4254 (1.80 - 2.80)

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	832	
1	B	832	
1	C	832	
1	D	832	

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Mol	Chain	Length	Quality of chain
1	E	832	<div><div></div><div>73%</div><div>15%</div><div>11%</div></div>
1	F	832	<div><div></div><div>72%</div><div>17%</div><div>11%</div></div>

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 66865 atoms, of which 33470 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 Transitional endoplasmic reticulum ATPase.

Mol	Chain	Residues	Atoms						AltConf	Trace
1	A	743	Total	C	H	N	O	S	0	0
			11680	3665	5849	1036	1100	30		
1	B	741	Total	C	H	N	O	S	0	0
			11634	3655	5819	1033	1097	30		
1	C	735	Total	C	H	N	O	S	0	0
			11558	3628	5786	1027	1088	29		
1	D	556	Total	C	H	N	O	S	0	0
			8686	2734	4343	774	813	22		
1	E	743	Total	C	H	N	O	S	0	0
			11680	3665	5849	1036	1100	30		
1	F	739	Total	C	H	N	O	S	0	0
			11627	3649	5824	1031	1093	30		

There are 156 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-25	MET	-	expression tag	UNP P55072
A	-24	GLY	-	expression tag	UNP P55072
A	-23	ASP	-	expression tag	UNP P55072
A	-22	TYR	-	expression tag	UNP P55072
A	-21	LYS	-	expression tag	UNP P55072
A	-20	ASP	-	expression tag	UNP P55072
A	-19	ASP	-	expression tag	UNP P55072
A	-18	ASP	-	expression tag	UNP P55072
A	-17	ASP	-	expression tag	UNP P55072
A	-16	LYS	-	expression tag	UNP P55072
A	-15	GLY	-	expression tag	UNP P55072
A	-14	GLY	-	expression tag	UNP P55072
A	-13	GLY	-	expression tag	UNP P55072
A	-12	SER	-	expression tag	UNP P55072
A	-11	GLY	-	expression tag	UNP P55072
A	-10	GLY	-	expression tag	UNP P55072
A	-9	LEU	-	expression tag	UNP P55072
A	-8	GLU	-	expression tag	UNP P55072

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-7	VAL	-	expression tag	UNP P55072
A	-6	LEU	-	expression tag	UNP P55072
A	-5	PHE	-	expression tag	UNP P55072
A	-4	GLN	-	expression tag	UNP P55072
A	-3	GLY	-	expression tag	UNP P55072
A	-2	PRO	-	expression tag	UNP P55072
A	-1	GLY	-	expression tag	UNP P55072
A	0	SER	-	expression tag	UNP P55072
B	-25	MET	-	expression tag	UNP P55072
B	-24	GLY	-	expression tag	UNP P55072
B	-23	ASP	-	expression tag	UNP P55072
B	-22	TYR	-	expression tag	UNP P55072
B	-21	LYS	-	expression tag	UNP P55072
B	-20	ASP	-	expression tag	UNP P55072
B	-19	ASP	-	expression tag	UNP P55072
B	-18	ASP	-	expression tag	UNP P55072
B	-17	ASP	-	expression tag	UNP P55072
B	-16	LYS	-	expression tag	UNP P55072
B	-15	GLY	-	expression tag	UNP P55072
B	-14	GLY	-	expression tag	UNP P55072
B	-13	GLY	-	expression tag	UNP P55072
B	-12	SER	-	expression tag	UNP P55072
B	-11	GLY	-	expression tag	UNP P55072
B	-10	GLY	-	expression tag	UNP P55072
B	-9	LEU	-	expression tag	UNP P55072
B	-8	GLU	-	expression tag	UNP P55072
B	-7	VAL	-	expression tag	UNP P55072
B	-6	LEU	-	expression tag	UNP P55072
B	-5	PHE	-	expression tag	UNP P55072
B	-4	GLN	-	expression tag	UNP P55072
B	-3	GLY	-	expression tag	UNP P55072
B	-2	PRO	-	expression tag	UNP P55072
B	-1	GLY	-	expression tag	UNP P55072
B	0	SER	-	expression tag	UNP P55072
C	-25	MET	-	expression tag	UNP P55072
C	-24	GLY	-	expression tag	UNP P55072
C	-23	ASP	-	expression tag	UNP P55072
C	-22	TYR	-	expression tag	UNP P55072
C	-21	LYS	-	expression tag	UNP P55072
C	-20	ASP	-	expression tag	UNP P55072
C	-19	ASP	-	expression tag	UNP P55072
C	-18	ASP	-	expression tag	UNP P55072

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-17	ASP	-	expression tag	UNP P55072
C	-16	LYS	-	expression tag	UNP P55072
C	-15	GLY	-	expression tag	UNP P55072
C	-14	GLY	-	expression tag	UNP P55072
C	-13	GLY	-	expression tag	UNP P55072
C	-12	SER	-	expression tag	UNP P55072
C	-11	GLY	-	expression tag	UNP P55072
C	-10	GLY	-	expression tag	UNP P55072
C	-9	LEU	-	expression tag	UNP P55072
C	-8	GLU	-	expression tag	UNP P55072
C	-7	VAL	-	expression tag	UNP P55072
C	-6	LEU	-	expression tag	UNP P55072
C	-5	PHE	-	expression tag	UNP P55072
C	-4	GLN	-	expression tag	UNP P55072
C	-3	GLY	-	expression tag	UNP P55072
C	-2	PRO	-	expression tag	UNP P55072
C	-1	GLY	-	expression tag	UNP P55072
C	0	SER	-	expression tag	UNP P55072
D	-25	MET	-	expression tag	UNP P55072
D	-24	GLY	-	expression tag	UNP P55072
D	-23	ASP	-	expression tag	UNP P55072
D	-22	TYR	-	expression tag	UNP P55072
D	-21	LYS	-	expression tag	UNP P55072
D	-20	ASP	-	expression tag	UNP P55072
D	-19	ASP	-	expression tag	UNP P55072
D	-18	ASP	-	expression tag	UNP P55072
D	-17	ASP	-	expression tag	UNP P55072
D	-16	LYS	-	expression tag	UNP P55072
D	-15	GLY	-	expression tag	UNP P55072
D	-14	GLY	-	expression tag	UNP P55072
D	-13	GLY	-	expression tag	UNP P55072
D	-12	SER	-	expression tag	UNP P55072
D	-11	GLY	-	expression tag	UNP P55072
D	-10	GLY	-	expression tag	UNP P55072
D	-9	LEU	-	expression tag	UNP P55072
D	-8	GLU	-	expression tag	UNP P55072
D	-7	VAL	-	expression tag	UNP P55072
D	-6	LEU	-	expression tag	UNP P55072
D	-5	PHE	-	expression tag	UNP P55072
D	-4	GLN	-	expression tag	UNP P55072
D	-3	GLY	-	expression tag	UNP P55072
D	-2	PRO	-	expression tag	UNP P55072

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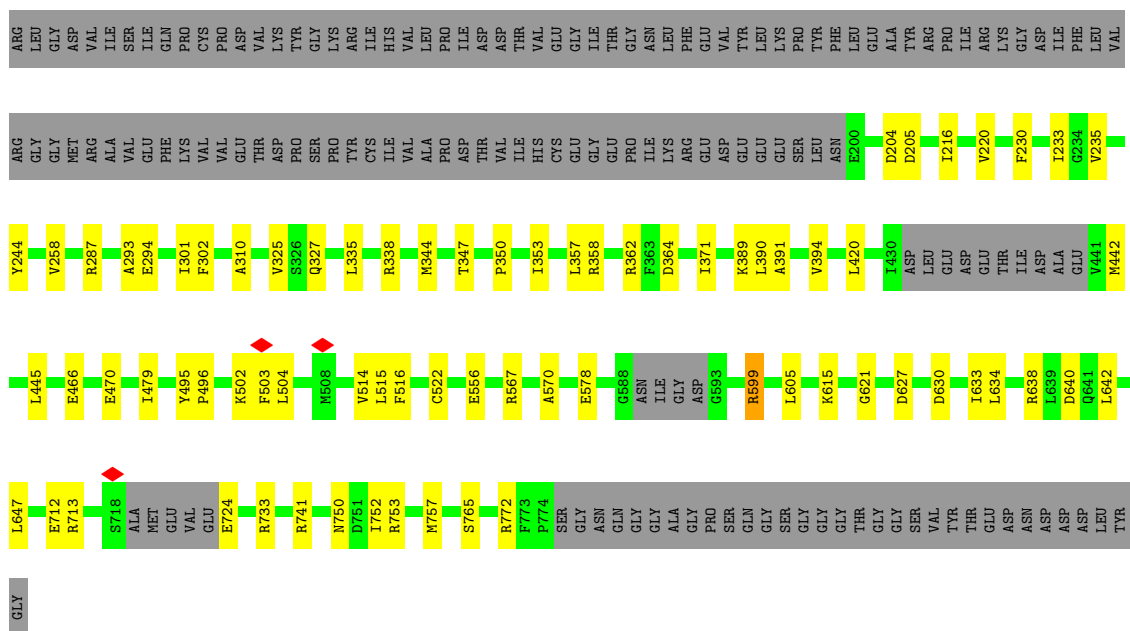
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Chain	Residue	Modelled	Actual	Comment	Reference
D	-1	GLY	-	expression tag	UNP P55072
D	0	SER	-	expression tag	UNP P55072
E	-25	MET	-	expression tag	UNP P55072
E	-24	GLY	-	expression tag	UNP P55072
E	-23	ASP	-	expression tag	UNP P55072
E	-22	TYR	-	expression tag	UNP P55072
E	-21	LYS	-	expression tag	UNP P55072
E	-20	ASP	-	expression tag	UNP P55072
E	-19	ASP	-	expression tag	UNP P55072
E	-18	ASP	-	expression tag	UNP P55072
E	-17	ASP	-	expression tag	UNP P55072
E	-16	LYS	-	expression tag	UNP P55072
E	-15	GLY	-	expression tag	UNP P55072
E	-14	GLY	-	expression tag	UNP P55072
E	-13	GLY	-	expression tag	UNP P55072
E	-12	SER	-	expression tag	UNP P55072
E	-11	GLY	-	expression tag	UNP P55072
E	-10	GLY	-	expression tag	UNP P55072
E	-9	LEU	-	expression tag	UNP P55072
E	-8	GLU	-	expression tag	UNP P55072
E	-7	VAL	-	expression tag	UNP P55072
E	-6	LEU	-	expression tag	UNP P55072
E	-5	PHE	-	expression tag	UNP P55072
E	-4	GLN	-	expression tag	UNP P55072
E	-3	GLY	-	expression tag	UNP P55072
E	-2	PRO	-	expression tag	UNP P55072
E	-1	GLY	-	expression tag	UNP P55072
E	0	SER	-	expression tag	UNP P55072
F	-25	MET	-	expression tag	UNP P55072
F	-24	GLY	-	expression tag	UNP P55072
F	-23	ASP	-	expression tag	UNP P55072
F	-22	TYR	-	expression tag	UNP P55072
F	-21	LYS	-	expression tag	UNP P55072
F	-20	ASP	-	expression tag	UNP P55072
F	-19	ASP	-	expression tag	UNP P55072
F	-18	ASP	-	expression tag	UNP P55072
F	-17	ASP	-	expression tag	UNP P55072
F	-16	LYS	-	expression tag	UNP P55072
F	-15	GLY	-	expression tag	UNP P55072
F	-14	GLY	-	expression tag	UNP P55072
F	-13	GLY	-	expression tag	UNP P55072
F	-12	SER	-	expression tag	UNP P55072

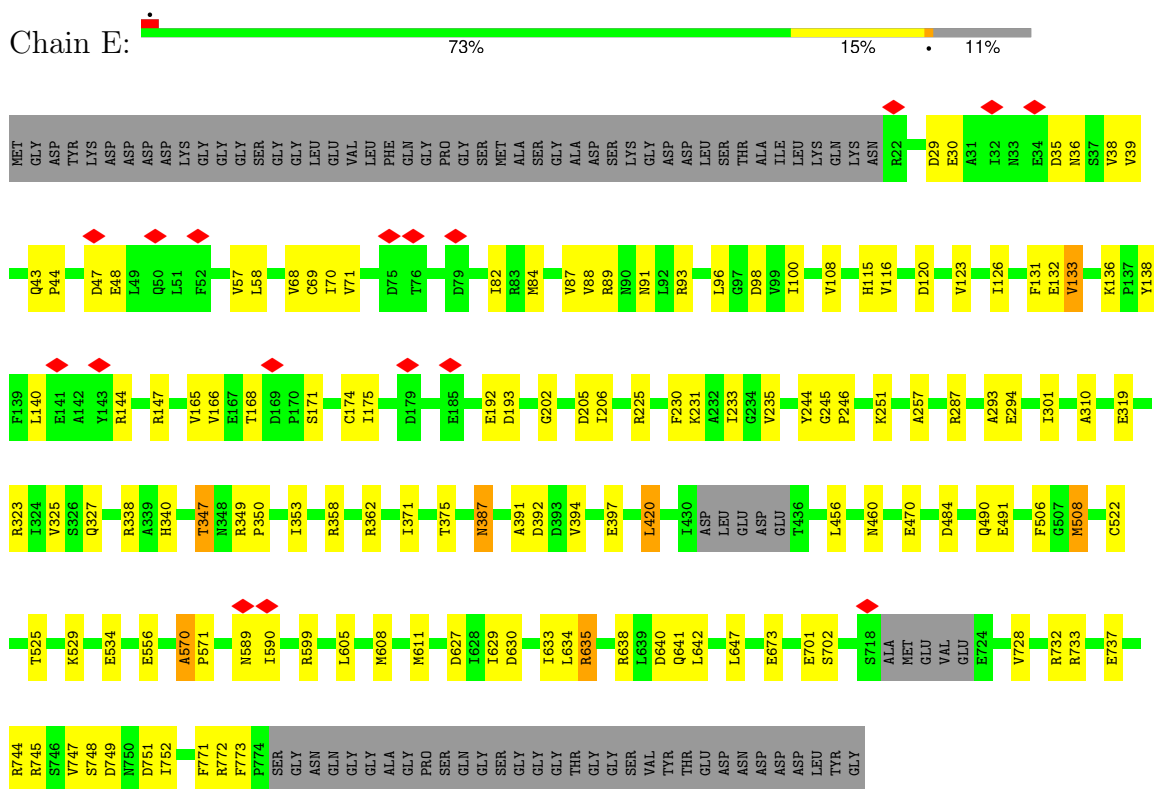
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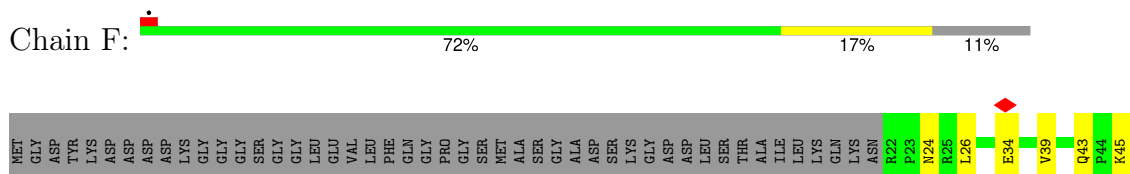
Chain	Residue	Modelled	Actual	Comment	Reference
F	-11	GLY	-	expression tag	UNP P55072
F	-10	GLY	-	expression tag	UNP P55072
F	-9	LEU	-	expression tag	UNP P55072
F	-8	GLU	-	expression tag	UNP P55072
F	-7	VAL	-	expression tag	UNP P55072
F	-6	LEU	-	expression tag	UNP P55072
F	-5	PHE	-	expression tag	UNP P55072
F	-4	GLN	-	expression tag	UNP P55072
F	-3	GLY	-	expression tag	UNP P55072
F	-2	PRO	-	expression tag	UNP P55072
F	-1	GLY	-	expression tag	UNP P55072
F	0	SER	-	expression tag	UNP P55072

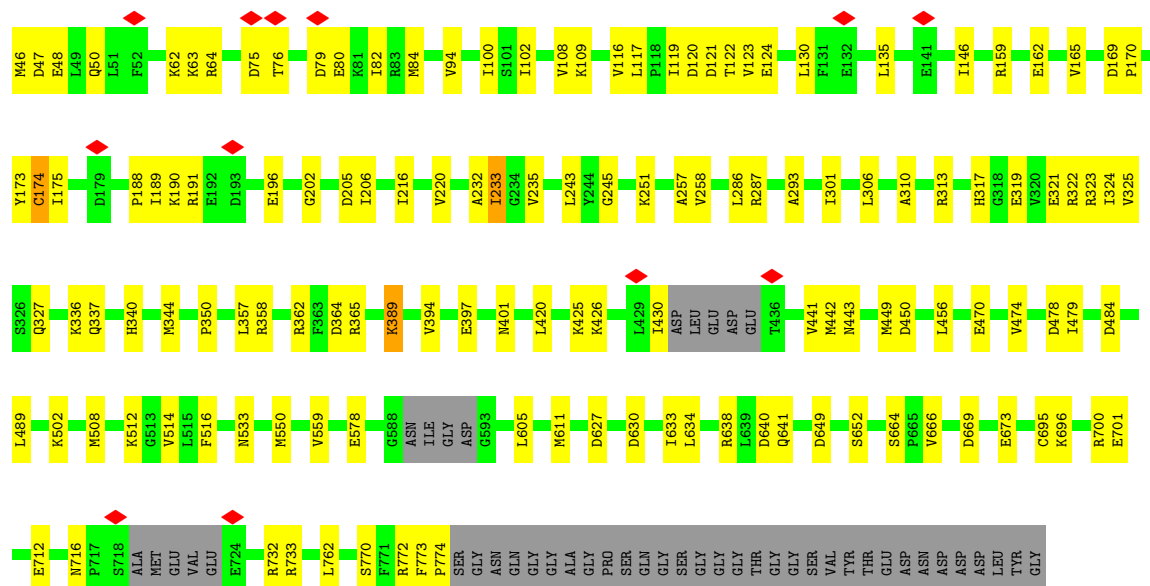


- Molecule 1: Transitional endoplasmic reticulum ATPase



- Molecule 1: Transitional endoplasmic reticulum ATPase





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	1369429	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	53.69	Depositor
Minimum defocus (nm)	900	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.192	Depositor
Minimum map value	-0.064	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.005	Depositor
Recommended contour level	0.02858	Depositor
Map size (\AA)	363.0, 363.0, 363.0	wwPDB
Map dimensions	440, 440, 440	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	0.825, 0.825, 0.825	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0/5928	0.24	0/8001
1	B	0.10	0/5911	0.24	0/7976
1	C	0.10	0/5868	0.25	0/7918
1	D	0.10	0/4416	0.24	0/5953
1	E	0.10	0/5928	0.25	0/8001
1	F	0.10	0/5899	0.25	0/7960
All	All	0.10	0/33950	0.25	0/45809

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 [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	5831	5849	5895	77	0
1	B	5815	5819	5877	73	0
1	C	5772	5786	5832	83	0
1	D	4343	4343	4389	57	0
1	E	5831	5849	5895	91	0
1	F	5803	5824	5870	112	0
All	All	33395	33470	33758	455	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 7.

All (455) 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:765:SER:OG	1:E:744:ARG:NH2	2.08	0.86
1:D:235:VAL:HG11	1:E:420:LEU:HD13	1.58	0.84
1:F:162:GLU:OE1	1:F:191:ARG:NH2	2.10	0.83
1:E:294:GLU:OE2	1:E:338:ARG:NE	2.14	0.81
1:B:512:LYS:NZ	1:B:611:MET:O	2.15	0.80
1:C:40:SER:OG	1:C:74:ASP:OD1	2.00	0.79
1:A:233:ILE:HG12	1:B:158:MET:HE2	1.65	0.78
1:D:634:LEU:HD22	1:D:642:LEU:HD11	1.65	0.78
1:D:294:GLU:OE2	1:D:338:ARG:NH1	2.16	0.77
1:B:491:GLU:OE2	1:C:700:ARG:NH1	2.18	0.76
1:A:669:ASP:OD1	1:A:733:ARG:NH2	2.19	0.76
1:E:168:THR:HG1	1:E:174:CYS:HG	1.21	0.75
1:B:56:THR:OG1	1:B:105:CYS:O	2.04	0.74
1:E:491:GLU:OE2	1:F:700:ARG:NH1	2.21	0.74
1:F:350:PRO:O	1:F:358:ARG:NH1	2.20	0.74
1:E:470:GLU:N	1:E:470:GLU:OE1	2.22	0.73
1:E:168:THR:OG1	1:E:174:CYS:SG	2.36	0.72
1:F:512:LYS:NZ	1:F:611:MET:O	2.22	0.72
1:A:425:LYS:NZ	1:A:450:ASP:OD2	2.22	0.71
1:C:86:ARG:NH2	1:C:205:ASP:OD2	2.23	0.71
1:E:570:ALA:HB1	1:E:571:PRO:HD2	1.73	0.70
1:A:71:VAL:O	1:A:72:LEU:HD22	1.92	0.70
1:C:470:GLU:OE1	1:C:470:GLU:N	2.25	0.70
1:E:319:GLU:OE2	1:E:323:ARG:NH1	2.24	0.70
1:D:371:ILE:HD11	1:D:466:GLU:HB2	1.74	0.69
1:A:397:GLU:O	1:A:401:ASN:ND2	2.25	0.69
1:A:56:THR:HG21	1:A:175:ILE:HD11	1.73	0.68
1:A:470:GLU:OE1	1:A:470:GLU:N	2.26	0.68
1:F:317:HIS:O	1:F:322:ARG:NH2	2.25	0.68
1:F:174:CYS:SG	1:F:175:ILE:N	2.66	0.68
1:D:391:ALA:O	1:D:394:VAL:HG22	1.93	0.68
1:A:40:SER:OG	1:A:74:ASP:OD1	2.09	0.68
1:C:350:PRO:O	1:C:358:ARG:NH1	2.27	0.68
1:C:381:LEU:O	1:C:385:THR:OG1	2.09	0.68
1:A:512:LYS:NZ	1:A:611:MET:O	2.27	0.67
1:E:231:LYS:O	1:F:159:ARG:NH2	2.27	0.67
1:D:750:ASN:OD1	1:D:753:ARG:NH2	2.28	0.66
1:E:30:GLU:OE2	1:E:89:ARG:NH2	2.29	0.66
1:B:350:PRO:O	1:B:358:ARG:NH1	2.28	0.66
1:E:570:ALA:HB1	1:E:571:PRO:CD	2.25	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:134:TYR:CD2	1:C:161:VAL:HG11	2.30	0.66
1:F:470:GLU:OE1	1:F:470:GLU:N	2.28	0.66
1:F:649:ASP:N	1:F:652:SER:OG	2.28	0.66
1:A:733:ARG:HH11	1:F:773:PHE:HB3	1.61	0.66
1:B:46:MET:SD	1:B:53:ARG:NH1	2.69	0.66
1:F:121:ASP:OD2	1:F:191:ARG:NH1	2.28	0.66
1:A:188:PRO:O	1:A:190:LYS:NZ	2.30	0.65
1:C:98:ASP:OD1	1:C:225:ARG:NH2	2.30	0.65
1:B:470:GLU:N	1:B:470:GLU:OE1	2.29	0.65
1:A:230:PHE:HA	1:A:233:ILE:HG22	1.78	0.65
1:A:391:ALA:O	1:A:394:VAL:HG22	1.97	0.64
1:B:773:PHE:HB2	1:C:733:ARG:HD2	1.80	0.64
1:D:335:LEU:HD23	1:D:338:ARG:HD2	1.78	0.64
1:C:243:LEU:HD11	1:C:344:MET:HE2	1.80	0.64
1:F:286:LEU:HD12	1:F:324:ILE:HD11	1.78	0.64
1:B:397:GLU:O	1:B:401:ASN:ND2	2.31	0.63
1:D:713:ARG:NH1	1:D:724:GLU:OE1	2.31	0.63
1:A:702:SER:OG	1:F:502:LYS:NZ	2.21	0.63
1:F:146:ILE:HG21	1:F:165:VAL:HG21	1.80	0.62
1:F:397:GLU:O	1:F:401:ASN:ND2	2.31	0.62
1:C:728:VAL:HG13	1:C:728:VAL:O	1.99	0.62
1:A:235:VAL:HG11	1:B:420:LEU:HD21	1.81	0.62
1:F:122:THR:HG21	1:F:162:GLU:H	1.64	0.62
1:D:470:GLU:N	1:D:470:GLU:OE1	2.33	0.62
1:A:38:VAL:HG13	1:A:72:LEU:HD23	1.82	0.61
1:A:121:ASP:OD2	1:A:191:ARG:NH1	2.33	0.61
1:A:397:GLU:OE1	1:A:397:GLU:N	2.33	0.61
1:F:188:PRO:O	1:F:190:LYS:NZ	2.33	0.61
1:A:47:ASP:OD1	1:A:48:GLU:N	2.34	0.61
1:F:245:GLY:O	1:F:251:LYS:NZ	2.34	0.61
1:E:235:VAL:HG11	1:F:420:LEU:HD22	1.83	0.61
1:B:121:ASP:OD2	1:B:191:ARG:NH1	2.33	0.60
1:D:522:CYS:SG	1:D:647:LEU:HD23	2.41	0.60
1:B:347:THR:HG21	1:B:353:ILE:HG23	1.82	0.60
1:C:294:GLU:OE2	1:C:338:ARG:NE	2.34	0.60
1:B:35:ASP:O	1:B:85:ASN:ND2	2.35	0.60
1:D:390:LEU:HB3	1:D:394:VAL:HG21	1.83	0.60
1:F:124:GLU:N	1:F:124:GLU:OE1	2.35	0.60
1:F:287:ARG:NH1	1:F:327:GLN:OE1	2.34	0.60
1:F:441:VAL:HG13	1:F:442:MET:CE	2.32	0.59
1:F:389:LYS:NZ	1:F:443:ASN:O	2.29	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:728:VAL:HG13	1:A:728:VAL:O	2.01	0.59
1:E:206:ILE:HD11	1:E:257:ALA:CB	2.32	0.59
1:E:350:PRO:O	1:E:358:ARG:NH1	2.35	0.59
1:D:556:GLU:OE2	1:D:599:ARG:NE	2.35	0.59
1:A:139:PHE:HB3	1:A:176:VAL:HG21	1.85	0.59
1:A:117:LEU:HD11	1:A:187:GLU:O	2.02	0.59
1:E:773:PHE:HB2	1:F:733:ARG:HD3	1.85	0.59
1:A:61:GLY:N	1:A:65:ARG:O	2.35	0.58
1:B:98:ASP:OD1	1:B:225:ARG:NH2	2.36	0.58
1:E:605:LEU:HD23	1:E:633:ILE:HD12	1.85	0.58
1:A:701:GLU:OE2	1:A:732:ARG:NH2	2.36	0.58
1:E:39:VAL:HG21	1:E:69:CYS:SG	2.43	0.58
1:E:522:CYS:SG	1:E:647:LEU:HD23	2.43	0.58
1:B:245:GLY:O	1:B:251:LYS:NZ	2.37	0.58
1:C:121:ASP:OD2	1:C:191:ARG:NH1	2.36	0.58
1:C:272:PRO:O	1:C:276:SER:OG	2.22	0.58
1:C:635:ARG:NH1	1:D:578:GLU:OE2	2.36	0.58
1:C:243:LEU:HD11	1:C:344:MET:CE	2.33	0.57
1:C:124:GLU:N	1:C:124:GLU:OE1	2.37	0.57
1:E:245:GLY:O	1:E:251:LYS:NZ	2.36	0.57
1:E:70:ILE:HD11	1:E:144:ARG:HA	1.86	0.57
1:C:188:PRO:O	1:C:190:LYS:NZ	2.31	0.57
1:C:362:ARG:O	1:C:364:ASP:N	2.38	0.57
1:B:119:ILE:HD13	1:B:162:GLU:HG3	1.87	0.57
1:C:314:GLU:OE1	1:C:314:GLU:N	2.37	0.57
1:B:206:ILE:HD11	1:B:257:ALA:CB	2.35	0.57
1:C:235:VAL:HG11	1:D:420:LEU:HD21	1.85	0.57
1:B:174:CYS:SG	1:B:175:ILE:N	2.78	0.57
1:F:441:VAL:HG13	1:F:442:MET:HE2	1.86	0.56
1:F:116:VAL:HG12	1:F:165:VAL:HG22	1.87	0.56
1:F:669:ASP:OD1	1:F:733:ARG:NH2	2.38	0.56
1:B:605:LEU:HD23	1:B:633:ILE:HD12	1.87	0.56
1:C:245:GLY:O	1:C:251:LYS:NZ	2.39	0.56
1:C:397:GLU:OE1	1:C:397:GLU:N	2.37	0.56
1:D:362:ARG:O	1:D:364:ASP:N	2.38	0.56
1:E:82:ILE:HD13	1:E:100:ILE:HD11	1.88	0.56
1:B:362:ARG:O	1:B:364:ASP:N	2.39	0.56
1:E:397:GLU:OE1	1:E:397:GLU:N	2.37	0.56
1:F:46:MET:O	1:F:50:GLN:N	2.39	0.56
1:B:122:THR:HG21	1:B:162:GLU:HG2	1.87	0.55
1:C:640:ASP:OD1	1:C:641:GLN:N	2.39	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:122:THR:HG23	1:F:123:VAL:HG13	1.87	0.55
1:E:647:LEU:HD21	1:E:747:VAL:HG21	1.88	0.55
1:D:502:LYS:NZ	1:E:702:SER:OG	2.34	0.55
1:A:216:ILE:O	1:A:220:VAL:HG22	2.07	0.55
1:D:350:PRO:O	1:D:358:ARG:NH1	2.39	0.55
1:D:442:MET:HA	1:D:445:LEU:HD23	1.88	0.55
1:D:442:MET:SD	1:D:442:MET:N	2.79	0.55
1:F:24:ASN:O	1:F:102:ILE:HG22	2.07	0.55
1:F:362:ARG:O	1:F:364:ASP:N	2.40	0.55
1:A:522:CYS:SG	1:A:647:LEU:HD23	2.47	0.55
1:C:129:ASN:ND2	1:C:132:GLU:OE1	2.39	0.55
1:E:608:MET:HE1	1:E:633:ILE:HD11	1.89	0.54
1:A:46:MET:SD	1:A:46:MET:N	2.80	0.54
1:B:206:ILE:HD11	1:B:257:ALA:HB3	1.89	0.54
1:F:673:GLU:OE1	1:F:673:GLU:N	2.40	0.54
1:E:230:PHE:HA	1:E:233:ILE:HG22	1.89	0.54
1:C:701:GLU:OE2	1:C:732:ARG:NH1	2.38	0.54
1:D:235:VAL:HG11	1:E:420:LEU:CD1	2.35	0.54
1:D:371:ILE:HD11	1:D:466:GLU:CB	2.37	0.54
1:E:235:VAL:HG11	1:F:420:LEU:CD2	2.38	0.54
1:C:235:VAL:HG11	1:D:420:LEU:CD2	2.38	0.54
1:E:391:ALA:O	1:E:394:VAL:HG22	2.08	0.54
1:B:220:VAL:HG21	1:B:258:VAL:HG11	1.90	0.54
1:A:315:LYS:O	1:F:313:ARG:NH2	2.38	0.53
1:C:438:ASP:HB2	1:C:441:VAL:HG22	1.89	0.53
1:B:669:ASP:O	1:B:733:ARG:NE	2.41	0.53
1:F:45:LYS:NZ	1:F:79:ASP:O	2.36	0.53
1:A:176:VAL:HG13	1:A:176:VAL:O	2.08	0.53
1:A:220:VAL:HG21	1:A:258:VAL:HG11	1.90	0.53
1:B:605:LEU:CD2	1:B:633:ILE:HD12	2.39	0.53
1:F:26:LEU:HD12	1:F:102:ILE:HG21	1.91	0.53
1:B:673:GLU:N	1:B:673:GLU:OE1	2.39	0.53
1:B:701:GLU:OE2	1:B:732:ARG:NH1	2.39	0.53
1:F:196:GLU:OE1	1:F:196:GLU:N	2.42	0.53
1:F:484:ASP:OD1	1:F:484:ASP:N	2.41	0.53
1:F:117:LEU:HD22	1:F:189:ILE:HG13	1.92	0.53
1:C:132:GLU:O	1:C:134:TYR:N	2.41	0.52
1:C:282:SER:HB3	1:C:324:ILE:HD11	1.91	0.52
1:A:158:MET:HE1	1:F:233:ILE:HG23	1.92	0.52
1:E:168:THR:HG23	1:E:171:SER:HA	1.91	0.52
1:C:86:ARG:NH1	1:C:200:GLU:O	2.43	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:425:LYS:NZ	1:F:450:ASP:OD2	2.42	0.52
1:B:765:SER:OG	1:C:744:ARG:NH2	2.43	0.52
1:E:371:ILE:N	1:E:371:ILE:HD12	2.25	0.52
1:F:479:ILE:HG23	1:F:479:ILE:O	2.09	0.52
1:B:43:GLN:OE1	1:B:46:MET:HE2	2.09	0.52
1:C:771:PHE:O	1:C:772:ARG:NH1	2.38	0.52
1:F:286:LEU:HD12	1:F:324:ILE:CD1	2.39	0.52
1:A:30:GLU:HG2	1:A:96:LEU:HD11	1.91	0.52
1:D:605:LEU:HD23	1:D:633:ILE:HD12	1.92	0.52
1:F:321:GLU:O	1:F:324:ILE:HG22	2.10	0.52
1:F:605:LEU:HD23	1:F:633:ILE:HD12	1.92	0.52
1:E:673:GLU:N	1:E:673:GLU:OE1	2.42	0.52
1:C:158:MET:N	1:C:387:ASN:O	2.41	0.51
1:E:287:ARG:NH1	1:E:327:GLN:OE1	2.42	0.51
1:F:26:LEU:CD1	1:F:102:ILE:HG21	2.41	0.51
1:E:206:ILE:HD11	1:E:257:ALA:HB3	1.92	0.51
1:E:347:THR:HG21	1:E:353:ILE:HG23	1.92	0.51
1:D:638:ARG:O	1:D:640:ASP:N	2.43	0.51
1:E:748:SER:OG	1:E:751:ASP:OD1	2.25	0.51
1:A:243:LEU:HD11	1:A:344:MET:HE2	1.93	0.51
1:A:86:ARG:NH1	1:A:200:GLU:O	2.43	0.51
1:B:216:ILE:O	1:B:220:VAL:HG22	2.11	0.51
1:B:293:ALA:CB	1:B:301:ILE:HD11	2.41	0.51
1:A:390:LEU:HB3	1:A:394:VAL:HG21	1.93	0.51
1:C:206:ILE:HD11	1:C:257:ALA:CB	2.40	0.51
1:D:216:ILE:O	1:D:220:VAL:HG22	2.10	0.51
1:D:220:VAL:HG21	1:D:258:VAL:HG11	1.93	0.51
1:A:245:GLY:O	1:A:251:LYS:NZ	2.43	0.50
1:E:84:MET:HG3	1:E:88:VAL:HG23	1.93	0.50
1:C:638:ARG:O	1:C:640:ASP:N	2.44	0.50
1:A:84:MET:HE1	1:A:92:LEU:HD12	1.93	0.50
1:F:146:ILE:CG2	1:F:165:VAL:HG21	2.41	0.50
1:E:630:ASP:O	1:E:633:ILE:HG22	2.12	0.50
1:A:737:GLU:OE2	1:F:773:PHE:HB2	2.11	0.50
1:E:635:ARG:NH2	1:F:578:GLU:OE1	2.44	0.50
1:F:474:VAL:O	1:F:533:ASN:ND2	2.44	0.50
1:F:638:ARG:O	1:F:640:ASP:N	2.45	0.50
1:B:676:ALA:HA	1:B:679:THR:HG22	1.94	0.50
1:C:246:PRO:HG3	1:C:371:ILE:HD11	1.94	0.50
1:F:206:ILE:HD11	1:F:257:ALA:CB	2.42	0.50
1:A:46:MET:O	1:A:50:GLN:N	2.45	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:93:ARG:NE	1:B:194:GLU:OE1	2.41	0.50
1:B:623:THR:HG21	1:B:629:ILE:HD11	1.94	0.50
1:C:206:ILE:HD11	1:C:257:ALA:HB3	1.93	0.50
1:E:728:VAL:O	1:E:728:VAL:HG13	2.12	0.49
1:F:627:ASP:OD1	1:F:627:ASP:N	2.44	0.49
1:B:121:ASP:OD1	1:B:122:THR:HG23	2.12	0.49
1:B:627:ASP:OD1	1:B:627:ASP:N	2.45	0.49
1:E:387:ASN:OD1	1:E:387:ASN:N	2.45	0.49
1:A:627:ASP:OD1	1:A:627:ASP:N	2.45	0.49
1:B:233:ILE:HG12	1:C:158:MET:HE2	1.95	0.49
1:A:272:PRO:O	1:A:276:SER:OG	2.27	0.49
1:A:484:ASP:OD1	1:A:484:ASP:N	2.45	0.49
1:B:522:CYS:SG	1:B:647:LEU:HD23	2.52	0.49
1:D:389:LYS:NZ	1:D:442:MET:O	2.45	0.49
1:D:753:ARG:O	1:D:757:MET:HG3	2.13	0.49
1:F:34:GLU:N	1:F:34:GLU:OE1	2.46	0.49
1:A:638:ARG:O	1:A:640:ASP:N	2.46	0.49
1:B:23:PRO:O	1:B:45:LYS:NZ	2.37	0.49
1:D:204:ASP:OD1	1:D:205:ASP:N	2.46	0.49
1:D:605:LEU:CD2	1:D:633:ILE:HD12	2.43	0.49
1:B:391:ALA:O	1:B:394:VAL:HG22	2.13	0.49
1:A:131:PHE:O	1:A:136:LYS:N	2.46	0.48
1:B:293:ALA:HB3	1:B:301:ILE:HD11	1.95	0.48
1:D:293:ALA:CB	1:D:301:ILE:HD11	2.43	0.48
1:E:47:ASP:OD1	1:E:48:GLU:N	2.46	0.48
1:B:428:ASP:N	1:B:428:ASP:OD1	2.46	0.48
1:E:640:ASP:OD1	1:E:641:GLN:N	2.47	0.48
1:E:627:ASP:N	1:E:627:ASP:OD1	2.45	0.48
1:A:159:ARG:NH1	1:F:232:ALA:O	2.42	0.48
1:B:86:ARG:NH2	1:B:200:GLU:O	2.46	0.48
1:E:605:LEU:CD2	1:E:633:ILE:HD12	2.43	0.48
1:F:47:ASP:OD1	1:F:48:GLU:N	2.45	0.48
1:C:220:VAL:HG21	1:C:258:VAL:HG11	1.95	0.48
1:E:349:ARG:NH1	1:E:349:ARG:HB2	2.28	0.48
1:A:177:ALA:N	1:A:180:THR:OG1	2.43	0.48
1:B:58:LEU:HD13	1:B:59:LEU:N	2.29	0.48
1:C:712:GLU:HA	1:C:715:THR:HG22	1.96	0.48
1:F:319:GLU:OE2	1:F:323:ARG:NH2	2.47	0.48
1:C:772:ARG:HG2	1:C:772:ARG:HH11	1.79	0.48
1:E:293:ALA:CB	1:E:301:ILE:HD11	2.44	0.48
1:E:633:ILE:HG23	1:E:634:LEU:HD23	1.94	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:75:ASP:OD1	1:F:76:THR:N	2.47	0.48
1:F:293:ALA:HB3	1:F:301:ILE:HD11	1.95	0.48
1:D:230:PHE:HA	1:D:233:ILE:HG22	1.96	0.48
1:E:701:GLU:OE2	1:E:732:ARG:NH1	2.38	0.48
1:F:489:LEU:HD21	1:F:516:PHE:HZ	1.78	0.48
1:B:633:ILE:HG23	1:B:634:LEU:HD23	1.96	0.47
1:C:512:LYS:NZ	1:C:611:MET:O	2.44	0.47
1:E:98:ASP:OD1	1:E:225:ARG:NH2	2.47	0.47
1:C:74:ASP:OD2	1:C:77:CYS:N	2.48	0.47
1:D:516:PHE:N	1:D:621:GLY:O	2.45	0.47
1:E:647:LEU:HD11	1:E:752:ILE:HD11	1.95	0.47
1:E:36:ASN:ND2	1:E:138:TYR:OH	2.46	0.47
1:E:484:ASP:N	1:E:484:ASP:OD1	2.46	0.47
1:A:293:ALA:CB	1:A:301:ILE:HD11	2.45	0.47
1:D:504:LEU:H	1:D:504:LEU:HD22	1.80	0.47
1:D:640:ASP:N	1:D:640:ASP:OD1	2.48	0.47
1:E:131:PHE:O	1:E:136:LYS:N	2.45	0.47
1:C:216:ILE:O	1:C:220:VAL:HG22	2.14	0.47
1:C:349:ARG:NH1	1:C:349:ARG:HB2	2.30	0.47
1:F:206:ILE:HD11	1:F:257:ALA:HB3	1.95	0.47
1:A:42:SER:O	1:A:46:MET:HE1	2.15	0.47
1:F:293:ALA:CB	1:F:301:ILE:HD11	2.44	0.47
1:A:34:GLU:N	1:A:34:GLU:OE1	2.48	0.47
1:F:243:LEU:HD11	1:F:344:MET:HE2	1.97	0.47
1:B:607:GLU:OE1	1:C:465:ARG:NH2	2.47	0.46
1:F:202:GLY:N	1:F:205:ASP:OD2	2.48	0.46
1:B:71:VAL:O	1:B:72:LEU:HD22	2.15	0.46
1:D:627:ASP:OD1	1:D:627:ASP:N	2.42	0.46
1:E:745:ARG:NH2	1:E:749:ASP:OD1	2.43	0.46
1:A:350:PRO:O	1:A:358:ARG:NH1	2.49	0.46
1:B:90:ASN:O	1:B:93:ARG:NH1	2.47	0.46
1:E:202:GLY:N	1:E:205:ASP:OD2	2.48	0.46
1:D:287:ARG:NH1	1:D:327:GLN:OE1	2.43	0.46
1:A:310:ALA:HA	1:A:325:VAL:HG22	1.97	0.46
1:C:26:LEU:HD12	1:C:102:ILE:HG21	1.97	0.46
1:D:233:ILE:HG23	1:D:235:VAL:H	1.80	0.46
1:E:68:VAL:HG12	1:E:147:ARG:HB2	1.96	0.46
1:F:82:ILE:HG21	1:F:100:ILE:HD11	1.96	0.46
1:E:293:ALA:HB3	1:E:301:ILE:HD11	1.98	0.46
1:F:426:LYS:HD3	1:F:430:ILE:HD12	1.97	0.46
1:F:119:ILE:HD13	1:F:189:ILE:HD11	1.98	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:772:ARG:HG2	1:F:772:ARG:HH11	1.81	0.45
1:C:293:ALA:CB	1:C:301:ILE:HD11	2.47	0.45
1:B:310:ALA:HA	1:B:325:VAL:HG22	1.97	0.45
1:D:347:THR:HG21	1:D:353:ILE:HG23	1.97	0.45
1:E:38:VAL:HG13	1:E:39:VAL:N	2.30	0.45
1:F:220:VAL:HG21	1:F:258:VAL:HG11	1.97	0.45
1:B:335:LEU:HD11	1:B:343:VAL:CG2	2.47	0.45
1:C:63:LYS:NZ	1:C:194:GLU:OE1	2.33	0.45
1:D:630:ASP:O	1:D:633:ILE:HG22	2.17	0.45
1:E:556:GLU:OE2	1:E:599:ARG:NH1	2.49	0.45
1:F:514:VAL:HG23	1:F:641:GLN:HB2	1.97	0.45
1:B:235:VAL:HB	1:C:158:MET:HE1	1.98	0.45
1:C:769:GLY:HA2	1:D:741:ARG:HG2	1.99	0.45
1:F:189:ILE:C	1:F:189:ILE:HD12	2.42	0.45
1:F:189:ILE:HD12	1:F:189:ILE:O	2.17	0.45
1:F:442:MET:HE2	1:F:442:MET:N	2.31	0.45
1:F:605:LEU:CD2	1:F:633:ILE:HD12	2.47	0.45
1:B:51:LEU:O	1:B:53:ARG:NH1	2.50	0.45
1:B:120:ASP:OD1	1:B:121:ASP:N	2.50	0.45
1:E:57:VAL:HG21	1:E:71:VAL:CG2	2.47	0.45
1:F:310:ALA:HA	1:F:325:VAL:HG22	1.98	0.45
1:C:112:LYS:HA	1:C:180:THR:HG23	1.98	0.45
1:C:117:LEU:HD22	1:C:187:GLU:HB2	1.99	0.45
1:B:139:PHE:CD1	1:B:176:VAL:HG21	2.52	0.44
1:D:570:ALA:HB1	1:D:615:LYS:O	2.16	0.44
1:E:87:VAL:O	1:E:91:ASN:ND2	2.50	0.44
1:B:640:ASP:OD1	1:B:641:GLN:N	2.50	0.44
1:E:490:GLN:NE2	1:E:534:GLU:OE2	2.43	0.44
1:F:216:ILE:O	1:F:220:VAL:HG22	2.16	0.44
1:A:403:THR:HG22	1:A:456:LEU:HD21	1.99	0.44
1:F:313:ARG:CZ	1:F:322:ARG:HE	2.31	0.44
1:A:455:ALA:O	1:A:459:SER:N	2.51	0.44
1:A:269:ILE:HD11	1:A:289:ALA:CB	2.48	0.44
1:A:772:ARG:HG2	1:A:772:ARG:HH11	1.82	0.44
1:B:728:VAL:HG13	1:B:728:VAL:O	2.16	0.44
1:D:712:GLU:OE1	1:D:713:ARG:NE	2.44	0.44
1:E:108:VAL:HG23	1:E:175:ILE:HG12	2.00	0.44
1:E:246:PRO:HG3	1:E:371:ILE:HD11	1.98	0.44
1:A:696:LYS:HG3	1:F:508:MET:HE1	1.99	0.44
1:C:516:PHE:N	1:C:621:GLY:O	2.46	0.44
1:C:570:ALA:HB1	1:C:615:LYS:O	2.17	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:62:LYS:HG2	1:F:94:VAL:HG12	1.98	0.44
1:C:56:THR:HG23	1:C:105:CYS:O	2.18	0.44
1:C:490:GLN:NE2	1:C:534:GLU:OE2	2.44	0.44
1:C:522:CYS:SG	1:C:647:LEU:HD23	2.58	0.44
1:E:30:GLU:N	1:E:96:LEU:HD11	2.33	0.44
1:D:647:LEU:HD11	1:D:752:ILE:HD11	2.00	0.43
1:A:293:ALA:HB3	1:A:301:ILE:HD11	1.99	0.43
1:F:169:ASP:HB3	1:F:170:PRO:HD3	1.99	0.43
1:F:306:LEU:HD21	1:F:357:LEU:HD13	2.01	0.43
1:C:93:ARG:NH2	1:C:192:GLU:OE2	2.50	0.43
1:E:115:HIS:O	1:E:166:VAL:HG12	2.18	0.43
1:F:630:ASP:O	1:F:633:ILE:HG22	2.19	0.43
1:A:673:GLU:OE1	1:A:673:GLU:N	2.51	0.43
1:A:674:PHE:CE2	1:F:774:PRO:HD3	2.53	0.43
1:C:139:PHE:HB3	1:C:176:VAL:HG21	2.00	0.43
1:C:293:ALA:HB3	1:C:301:ILE:HD11	1.99	0.43
1:E:93:ARG:NH2	1:E:192:GLU:OE2	2.51	0.43
1:F:130:LEU:N	1:F:130:LEU:HD12	2.34	0.43
1:B:630:ASP:O	1:B:633:ILE:HG22	2.19	0.43
1:C:391:ALA:O	1:C:394:VAL:HG22	2.18	0.43
1:C:773:PHE:HB2	1:D:733:ARG:HD3	2.01	0.43
1:D:310:ALA:CB	1:D:357:LEU:HD11	2.48	0.43
1:E:57:VAL:HG21	1:E:71:VAL:HG21	2.01	0.43
1:D:293:ALA:HB3	1:D:301:ILE:HD11	2.01	0.43
1:C:630:ASP:O	1:C:633:ILE:HG22	2.17	0.43
1:E:43:GLN:HB2	1:E:44:PRO:HD3	2.01	0.43
1:A:744:ARG:NH2	1:F:762:LEU:O	2.49	0.43
1:D:772:ARG:HG2	1:D:772:ARG:HH11	1.83	0.43
1:D:772:ARG:HA	1:E:737:GLU:HG2	2.00	0.43
1:F:233:ILE:CG2	1:F:235:VAL:HG12	2.49	0.43
1:F:336:LYS:HD2	1:F:337:GLN:N	2.34	0.43
1:A:102:ILE:HG23	1:A:102:ILE:O	2.18	0.43
1:C:132:GLU:OE2	1:C:136:LYS:NZ	2.50	0.42
1:C:669:ASP:OD1	1:C:733:ARG:NE	2.52	0.42
1:D:244:TYR:HA	1:D:347:THR:O	2.19	0.42
1:D:310:ALA:HA	1:D:325:VAL:HG22	2.00	0.42
1:B:229:LEU:O	1:B:233:ILE:CG2	2.67	0.42
1:B:437:ILE:HB	1:B:442:MET:HE3	2.01	0.42
1:C:201:VAL:HG12	1:C:257:ALA:HB2	2.00	0.42
1:E:310:ALA:HA	1:E:325:VAL:HG22	2.00	0.42
1:A:117:LEU:HD13	1:A:118:PRO:HD2	2.01	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:638:ARG:O	1:B:640:ASP:N	2.50	0.42
1:E:35:ASP:OD1	1:E:36:ASN:N	2.53	0.42
1:A:30:GLU:OE2	1:A:89:ARG:NH2	2.47	0.42
1:C:47:ASP:OD1	1:C:48:GLU:N	2.52	0.42
1:F:478:ASP:N	1:F:478:ASP:OD1	2.51	0.42
1:F:712:GLU:O	1:F:716:ASN:N	2.52	0.42
1:A:98:ASP:OD1	1:A:225:ARG:NH2	2.53	0.42
1:F:64:ARG:HA	1:F:64:ARG:NE	2.34	0.42
1:F:701:GLU:OE2	1:F:732:ARG:NH1	2.51	0.42
1:E:570:ALA:CB	1:E:571:PRO:CD	2.95	0.42
1:C:68:VAL:HG11	1:C:173:TYR:HB3	2.02	0.42
1:D:496:PRO:HA	1:D:503:PHE:CZ	2.55	0.42
1:E:132:GLU:OE2	1:E:133:VAL:HG23	2.19	0.42
1:A:206:ILE:HD11	1:A:257:ALA:CB	2.49	0.42
1:A:244:TYR:HA	1:A:347:THR:O	2.19	0.42
1:B:92:LEU:HB3	1:B:94:VAL:HG22	2.02	0.42
1:B:484:ASP:N	1:B:484:ASP:OD1	2.51	0.42
1:C:158:MET:HA	1:C:387:ASN:O	2.19	0.42
1:E:634:LEU:HD22	1:E:642:LEU:HD11	2.00	0.42
1:F:364:ASP:OD1	1:F:365:ARG:N	2.53	0.42
1:A:749:ASP:HA	1:A:752:ILE:HD12	2.01	0.42
1:E:120:ASP:OD1	1:E:120:ASP:N	2.51	0.42
1:F:80:GLU:OE1	1:F:80:GLU:N	2.49	0.42
1:A:392:ASP:OD1	1:A:392:ASP:N	2.53	0.41
1:B:235:VAL:HG22	1:B:236:LYS:H	1.84	0.41
1:C:371:ILE:N	1:C:371:ILE:HD13	2.35	0.41
1:D:515:LEU:HD22	1:D:634:LEU:HD21	2.01	0.41
1:E:508:MET:HE3	1:F:696:LYS:HB2	2.02	0.41
1:F:108:VAL:O	1:F:108:VAL:HG13	2.20	0.41
1:A:118:PRO:HB2	1:A:123:VAL:HG11	2.03	0.41
1:F:489:LEU:HD21	1:F:516:PHE:CZ	2.55	0.41
1:E:57:VAL:HG12	1:E:58:LEU:N	2.35	0.41
1:C:394:VAL:HG23	1:C:394:VAL:O	2.20	0.41
1:E:506:PHE:HB3	1:F:695:CYS:SG	2.60	0.41
1:E:771:PHE:O	1:E:772:ARG:HD3	2.19	0.41
1:F:633:ILE:HG23	1:F:634:LEU:HD23	2.03	0.41
1:A:202:GLY:N	1:A:205:ASP:OD2	2.53	0.41
1:B:54:GLY:HA2	1:B:70:ILE:HG23	2.02	0.41
1:D:302:PHE:HA	1:D:344:MET:O	2.21	0.41
1:E:193:ASP:OD1	1:E:193:ASP:N	2.54	0.41
1:F:770:SER:HA	1:F:772:ARG:HH12	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:457:SER:OG	1:A:458:GLN:NE2	2.49	0.41
1:F:116:VAL:HG21	1:F:135:LEU:HD22	2.02	0.41
1:A:674:PHE:CD2	1:F:774:PRO:HD3	2.56	0.41
1:B:136:LYS:HB3	1:B:137:PRO:HD3	2.02	0.41
1:B:233:ILE:HG23	1:B:234:GLY:N	2.35	0.41
1:C:337:GLN:OE1	1:C:337:GLN:N	2.54	0.41
1:C:772:ARG:NH1	1:C:772:ARG:HG2	2.36	0.41
1:E:29:ASP:C	1:E:96:LEU:HD11	2.45	0.41
1:F:39:VAL:HG12	1:F:84:MET:HG2	2.02	0.41
1:A:653:ARG:HG2	1:A:687:LEU:HD11	2.02	0.41
1:F:640:ASP:OD1	1:F:641:GLN:N	2.51	0.41
1:B:46:MET:SD	1:B:46:MET:C	3.04	0.41
1:C:89:ARG:HG2	1:C:94:VAL:HG23	2.02	0.41
1:C:191:ARG:NE	1:C:195:GLU:OE1	2.45	0.41
1:C:302:PHE:HA	1:C:344:MET:O	2.20	0.41
1:C:495:TYR:HB2	1:C:496:PRO:HD3	2.03	0.41
1:C:514:VAL:HG22	1:C:515:LEU:N	2.36	0.41
1:E:165:VAL:HG23	1:E:165:VAL:O	2.19	0.41
1:E:244:TYR:HA	1:E:347:THR:O	2.21	0.41
1:E:392:ASP:OD1	1:E:392:ASP:N	2.53	0.41
1:E:525:THR:HG22	1:E:529:LYS:HE2	2.03	0.41
1:F:394:VAL:HG12	1:F:449:MET:N	2.36	0.41
1:A:75:ASP:OD1	1:A:76:THR:N	2.55	0.41
1:A:206:ILE:HD11	1:A:257:ALA:HB3	2.02	0.41
1:A:556:GLU:CD	1:A:599:ARG:HE	2.29	0.41
1:B:112:LYS:NZ	1:B:179:ASP:OD2	2.54	0.41
1:C:118:PRO:HG2	1:C:130:LEU:HD13	2.02	0.41
1:F:108:VAL:HG22	1:F:175:ILE:HG13	2.02	0.41
1:F:550:MET:SD	1:F:559:VAL:HG23	2.61	0.41
1:B:385:THR:HG22	1:B:388:MET:HE2	2.02	0.40
1:B:495:TYR:HB2	1:B:496:PRO:HD3	2.03	0.40
1:E:123:VAL:HA	1:E:126:ILE:HG22	2.03	0.40
1:A:335:LEU:HD11	1:A:343:VAL:CG2	2.51	0.40
1:B:707:ILE:O	1:B:710:GLU:HG3	2.20	0.40
1:D:514:VAL:HG22	1:D:515:LEU:N	2.37	0.40
1:F:120:ASP:OD1	1:F:120:ASP:N	2.54	0.40
1:C:244:TYR:HA	1:C:347:THR:O	2.21	0.40
1:F:43:GLN:OE1	1:F:46:MET:HE1	2.20	0.40
1:F:426:LYS:CD	1:F:430:ILE:HD12	2.51	0.40
1:B:608:MET:HE2	1:B:638:ARG:HA	2.03	0.40
1:B:769:GLY:HA2	1:C:741:ARG:HG2	2.04	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:F:664:SER:O	1:F:666:VAL:HG23	2.20	0.40
1:D:567:ARG:NH1	1:E:460:ASN:OD1	2.55	0.40
1:E:589:ASN:OD1	1:E:590:ILE:N	2.54	0.40
1:F:63:LYS:O	1:F:63:LYS:CG	2.69	0.40
1:F:119:ILE:O	1:F:123:VAL:HG22	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

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	737/832 (89%)	717 (97%)	20 (3%)	0	100	100
1	B	733/832 (88%)	715 (98%)	18 (2%)	0	100	100
1	C	727/832 (87%)	714 (98%)	13 (2%)	0	100	100
1	D	548/832 (66%)	538 (98%)	10 (2%)	0	100	100
1	E	737/832 (89%)	719 (98%)	17 (2%)	1 (0%)	48	60
1	F	731/832 (88%)	704 (96%)	27 (4%)	0	100	100
All	All	4213/4992 (84%)	4107 (98%)	105 (2%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	E	570	ALA

5.3.2 Protein sidechains [i](#)

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	633/696 (91%)	624 (99%)	9 (1%)	62	77
1	B	631/696 (91%)	618 (98%)	13 (2%)	48	66
1	C	626/696 (90%)	620 (99%)	6 (1%)	73	85
1	D	463/696 (66%)	460 (99%)	3 (1%)	84	92
1	E	633/696 (91%)	617 (98%)	16 (2%)	42	60
1	F	630/696 (90%)	623 (99%)	7 (1%)	70	83
All	All	3616/4176 (87%)	3562 (98%)	54 (2%)	60	76

All (54) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	53	ARG
1	A	72	LEU
1	A	113	ARG
1	A	117	LEU
1	A	222	LEU
1	A	294	GLU
1	A	340	HIS
1	A	448	THR
1	A	555	SER
1	B	40	SER
1	B	58	LEU
1	B	161	VAL
1	B	174	CYS
1	B	183	HIS
1	B	222	LEU
1	B	316	THR
1	B	347	THR
1	B	352	SER
1	B	438	ASP
1	B	613	THR
1	B	629	ILE
1	B	746	SER
1	C	348	ASN
1	C	387	ASN
1	C	421	GLN
1	C	438	ASP
1	C	555	SER

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Mol	Chain	Res	Type
1	C	669	ASP
1	D	479	ILE
1	D	495	TYR
1	D	599	ARG
1	E	116	VAL
1	E	133	VAL
1	E	140	LEU
1	E	340	HIS
1	E	347	THR
1	E	362	ARG
1	E	375	THR
1	E	387	ASN
1	E	420	LEU
1	E	456	LEU
1	E	508	MET
1	E	611	MET
1	E	629	ILE
1	E	635	ARG
1	E	638	ARG
1	E	733	ARG
1	F	109	LYS
1	F	173	TYR
1	F	174	CYS
1	F	233	ILE
1	F	340	HIS
1	F	389	LYS
1	F	456	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (29) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	317	HIS
1	A	404	HIS
1	A	536	GLN
1	A	624	ASN
1	B	317	HIS
1	B	443	ASN
1	B	533	ASN
1	B	624	ASN
1	B	680	ASN
1	C	24	ASN
1	C	443	ASN

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Mol	Chain	Res	Type
1	C	460	ASN
1	C	499	HIS
1	C	624	ASN
1	C	716	ASN
1	D	398	GLN
1	D	458	GLN
1	D	692	GLN
1	E	50	GLN
1	E	296	ASN
1	E	499	HIS
1	E	624	ASN
1	F	115	HIS
1	F	296	ASN
1	F	406	HIS
1	F	499	HIS
1	F	624	ASN
1	F	692	GLN
1	F	716	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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](#)

There are no ligands in this entry.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

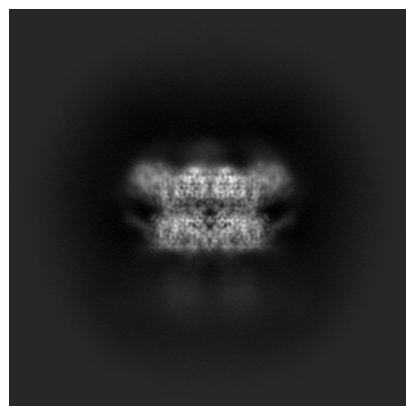
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-48499. These allow visual inspection of the internal detail of the map and identification of artifacts.

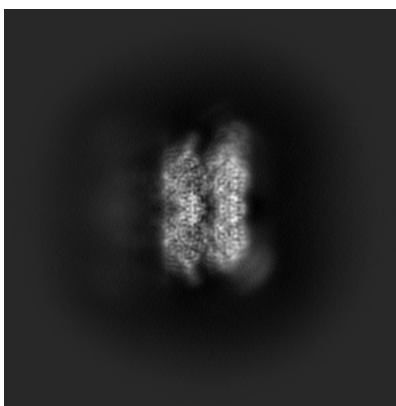
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

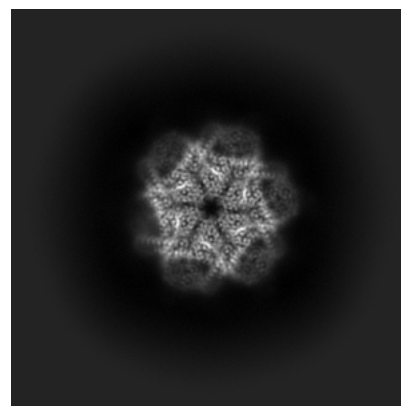
6.1.1 Primary map



X

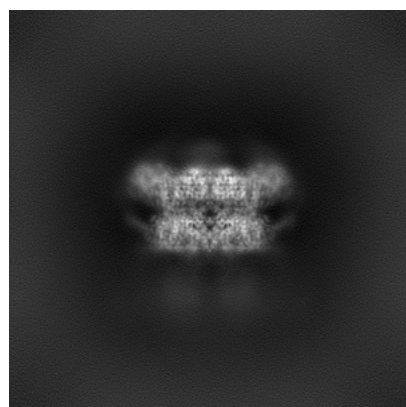


Y

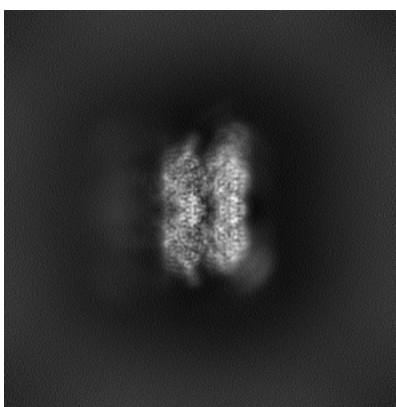


Z

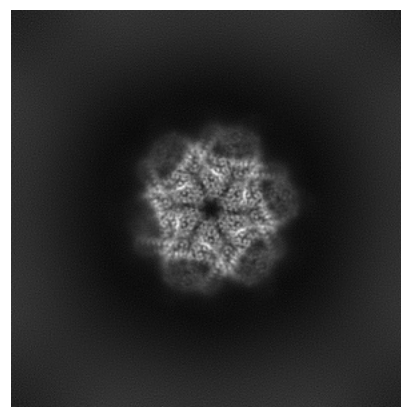
6.1.2 Raw map



X



Y

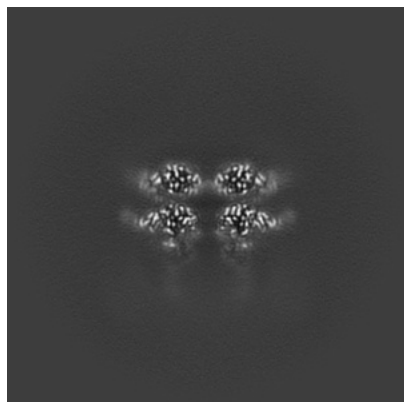


Z

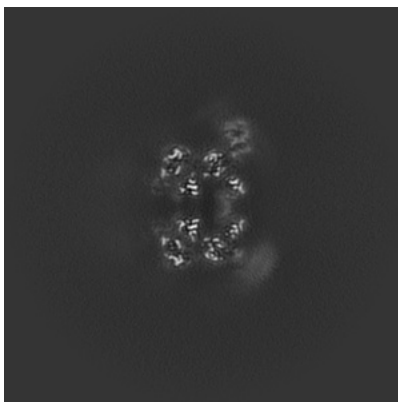
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

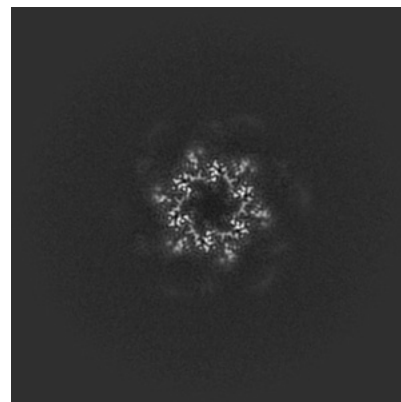
6.2.1 Primary map



X Index: 220

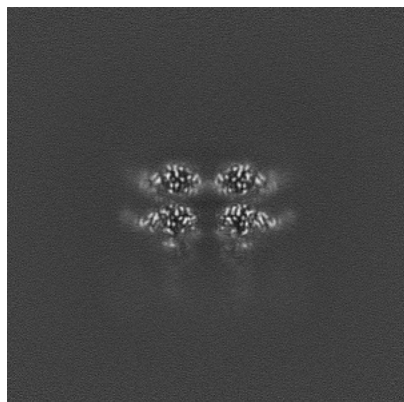


Y Index: 220

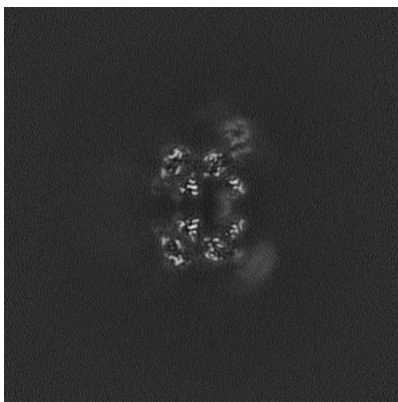


Z Index: 220

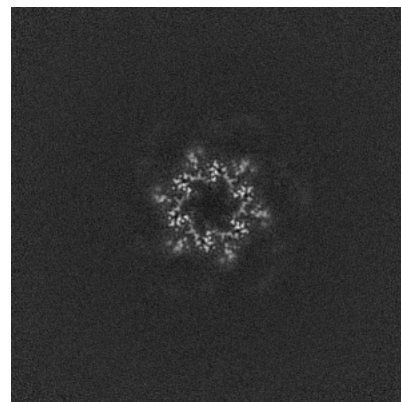
6.2.2 Raw map



X Index: 220



Y Index: 220

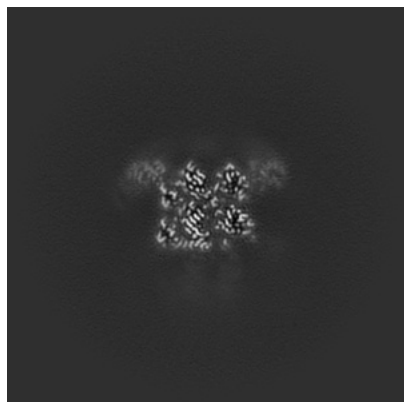


Z Index: 220

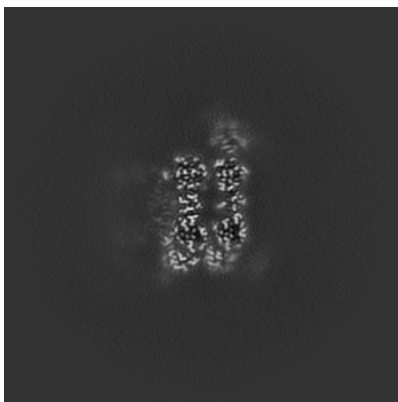
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

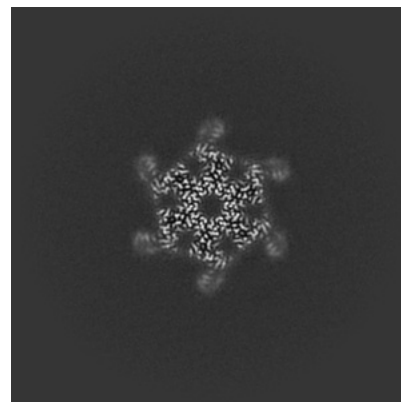
6.3.1 Primary map



X Index: 182

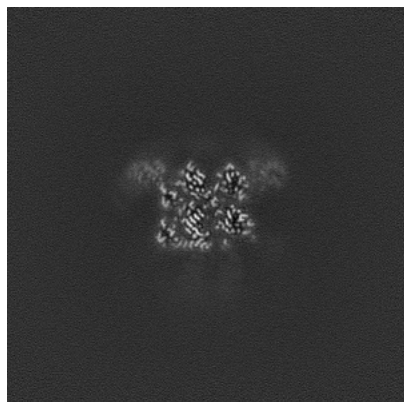


Y Index: 240

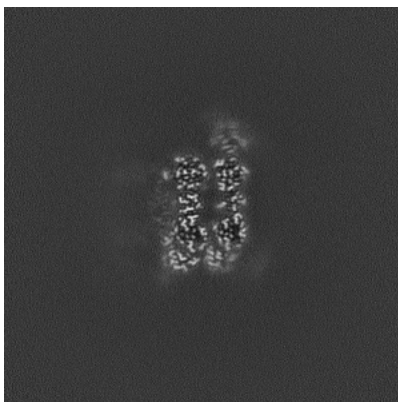


Z Index: 207

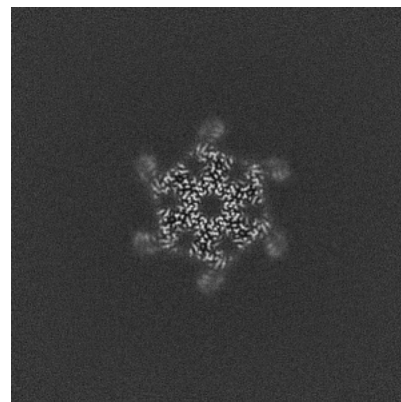
6.3.2 Raw map



X Index: 182



Y Index: 240



Z Index: 207

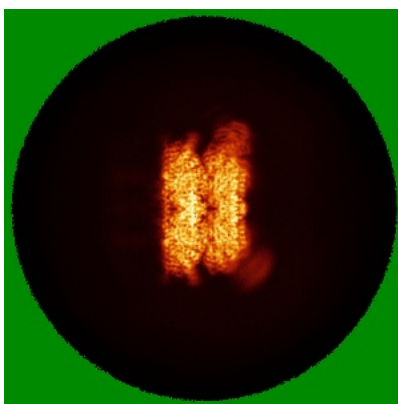
The images above show the largest variance slices of the map in three orthogonal directions.

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

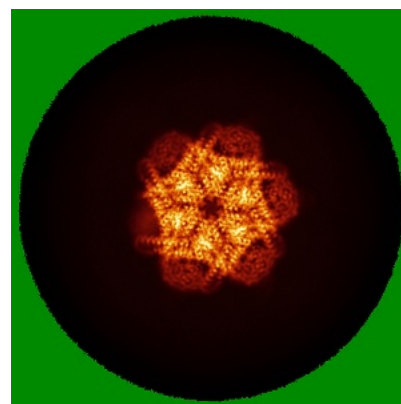
6.4.1 Primary map



X

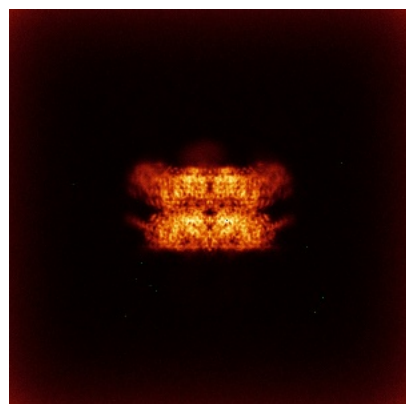


Y

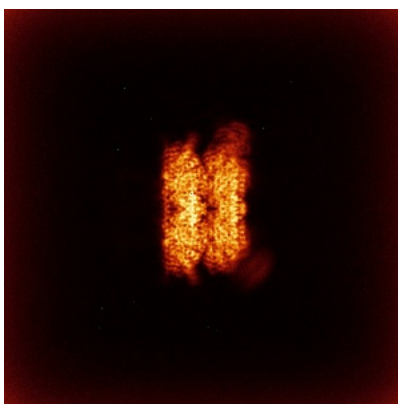


Z

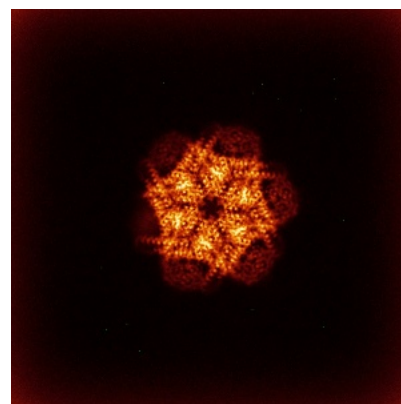
6.4.2 Raw map



X



Y



Z

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

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.02858. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

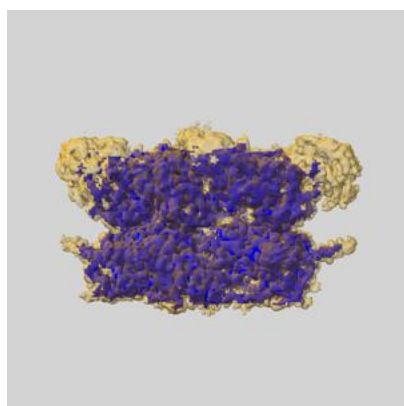
6.6 Mask visualisation [i](#)

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

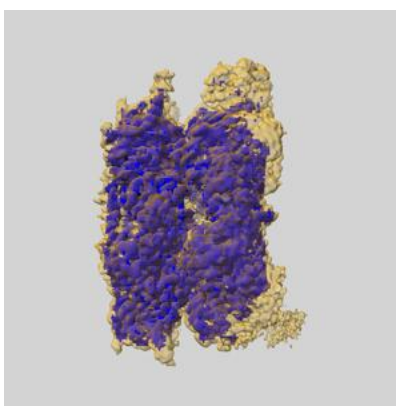
A mask typically either:

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

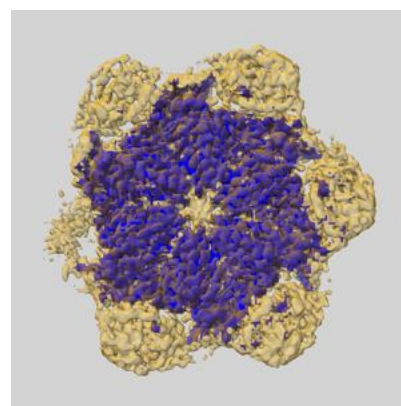
6.6.1 emd_48499_msk_1.map [i](#)



X



Y

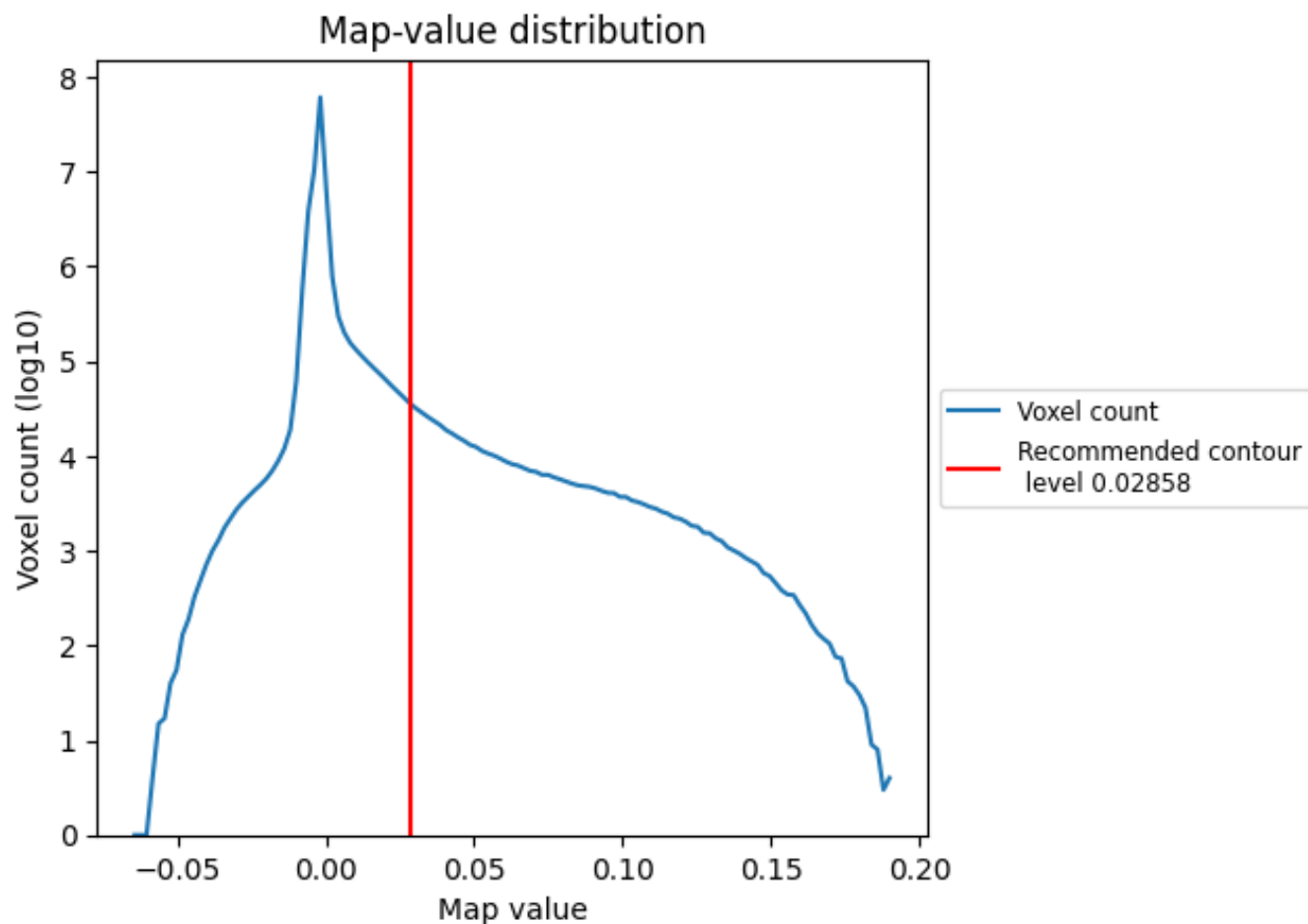


Z

7 Map analysis [i](#)

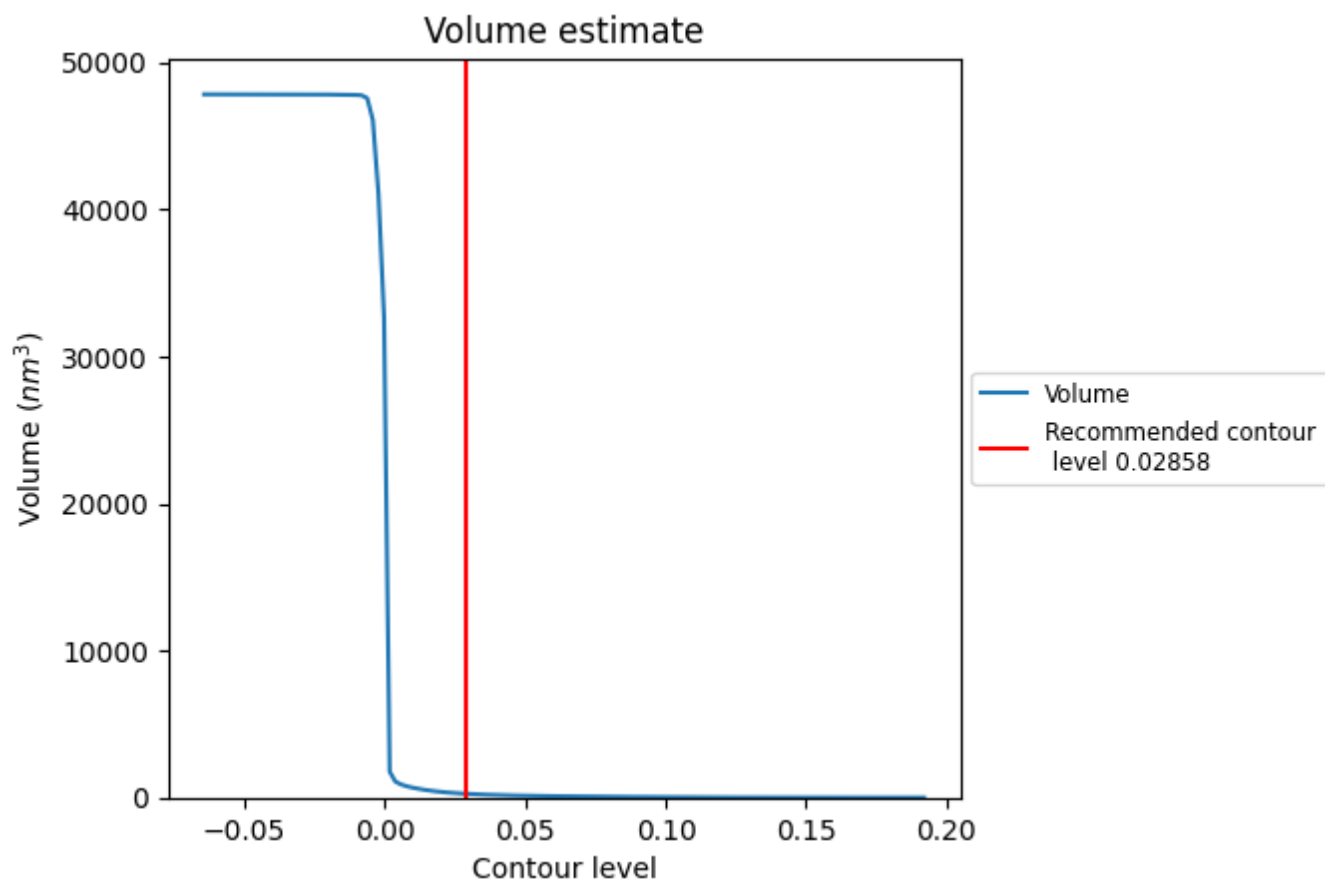
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

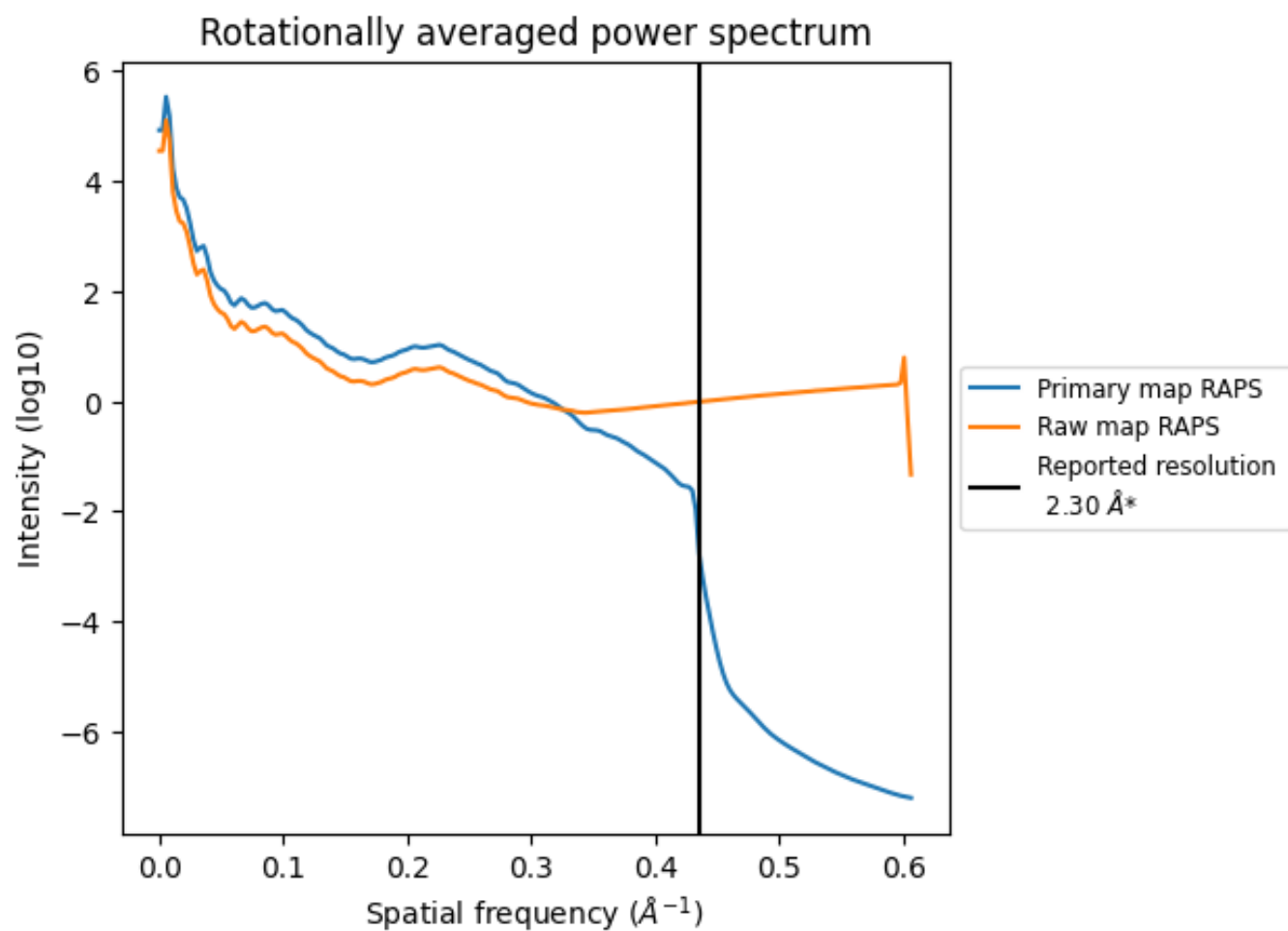
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 260 nm³; this corresponds to an approximate mass of 235 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 ⓘ

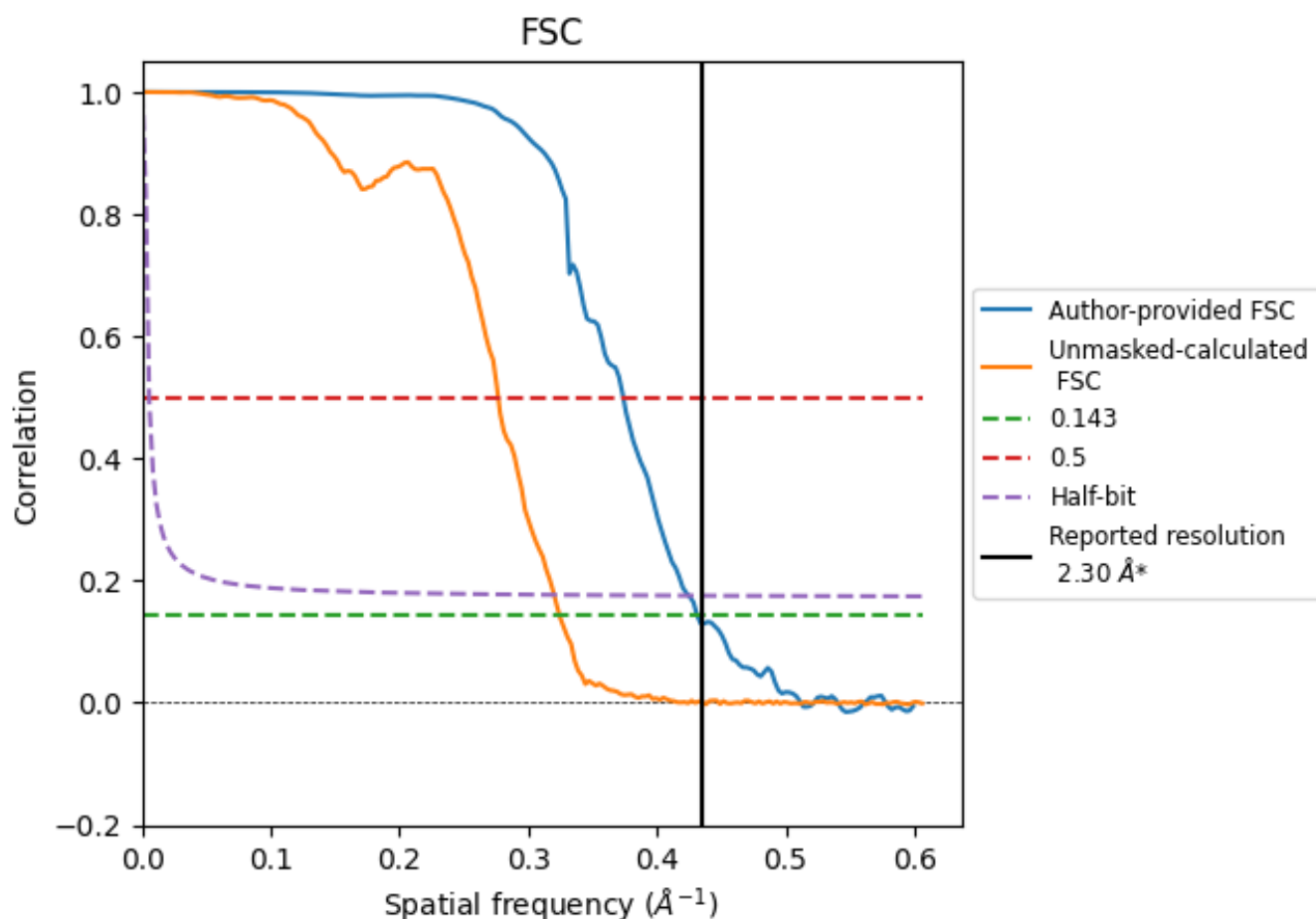


*Reported resolution corresponds to spatial frequency of 0.435 Å⁻¹

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 0.435 Å⁻¹

8.2 Resolution estimates [i](#)

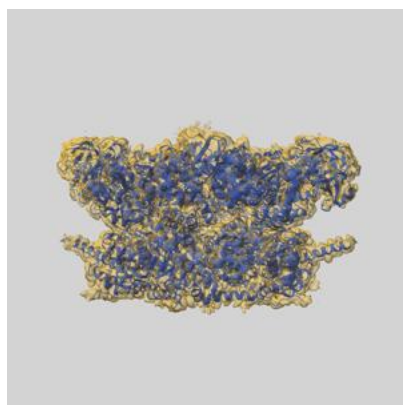
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.30	-	-
Author-provided FSC curve	2.32	2.68	2.35
Unmasked-calculated*	3.08	3.62	3.12

*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 3.08 differs from the reported value 2.3 by more than 10 %

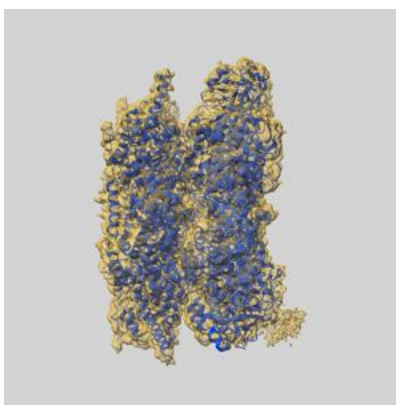
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-48499 and PDB model 9MPQ. Per-residue inclusion information can be found in section [3](#) on page [9](#).

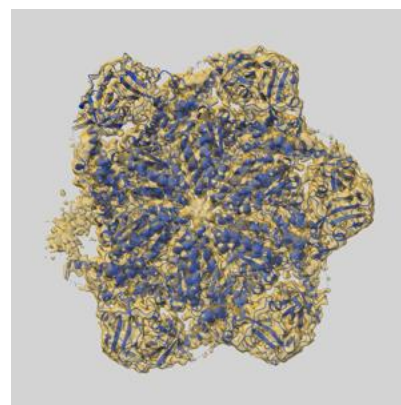
9.1 Map-model overlay [i](#)



X



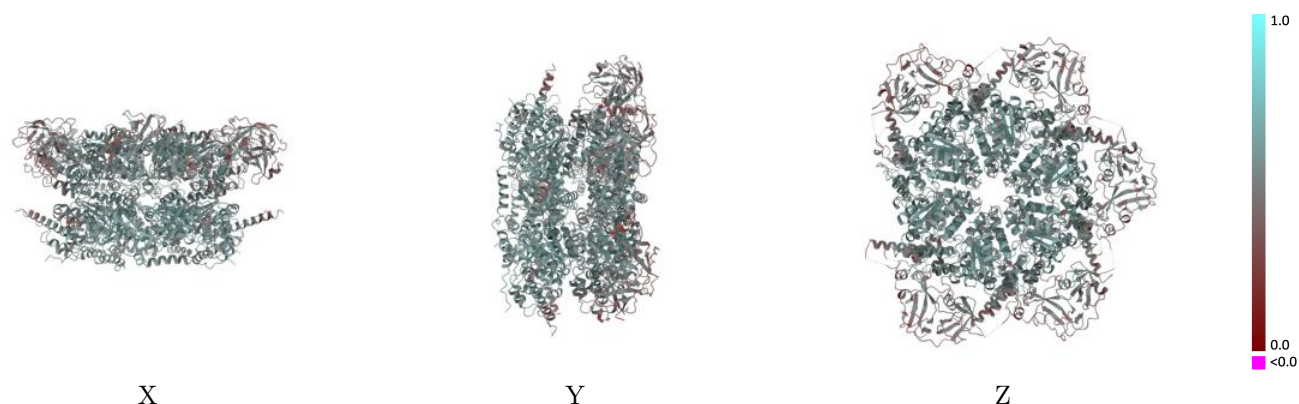
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.02858 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](#)



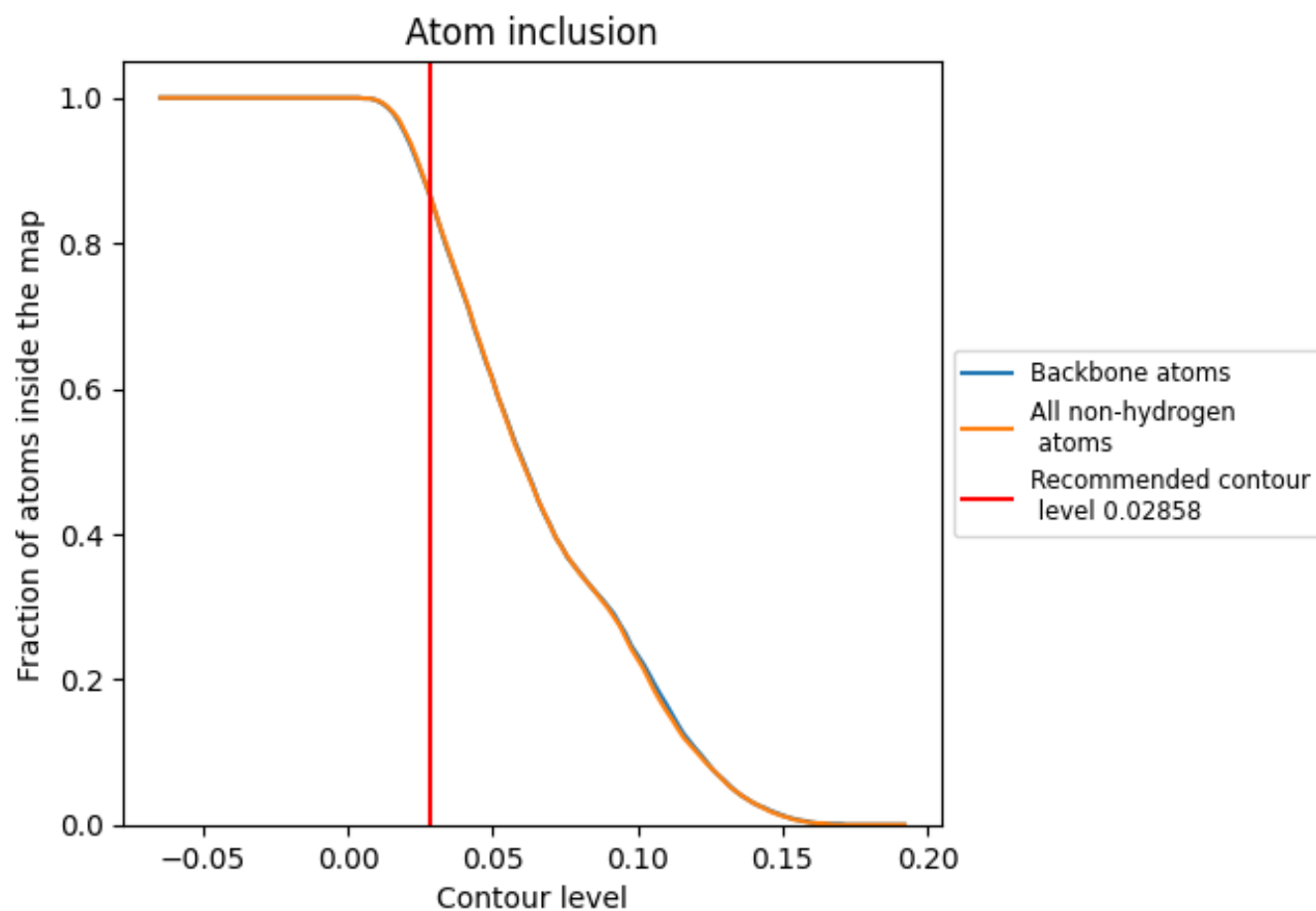
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.02858).

9.4 Atom inclusion [i](#)



At the recommended contour level, 86% 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 (0.02858) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div><div></div></div> 0.8640	<div><div></div></div> 0.5350
A	<div><div></div></div> 0.8830	<div><div></div></div> 0.5360
B	<div><div></div></div> 0.8730	<div><div></div></div> 0.5340
C	<div><div></div></div> 0.8170	<div><div></div></div> 0.5240
D	<div><div></div></div> 0.9310	<div><div></div></div> 0.5640
E	<div><div></div></div> 0.8690	<div><div></div></div> 0.5300
F	<div><div></div></div> 0.8800	<div><div></div></div> 0.5300

1.0

0.0

<0.0