



Full wwPDB EM Validation Report ⓘ

Apr 5, 2026 – 09:26 PM UTC

PDB ID : 9RLZ / pdb_00009rlz
EMDB ID : EMD-54046
Title : 15S proteasome precursor complex
Authors : Mark, E.; Ramos, P.C.; Nunes, M.M.; Dohmen, R.J.; Wendler, P.
Deposited on : 2025-06-17
Resolution : 3.12 Å(reported)
Based on initial model : 8RVL

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:

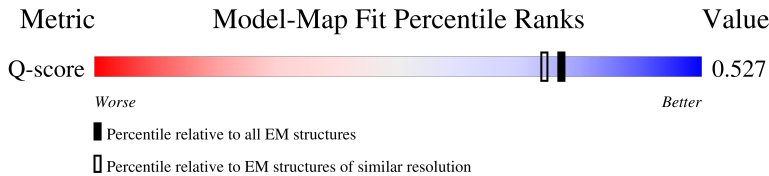
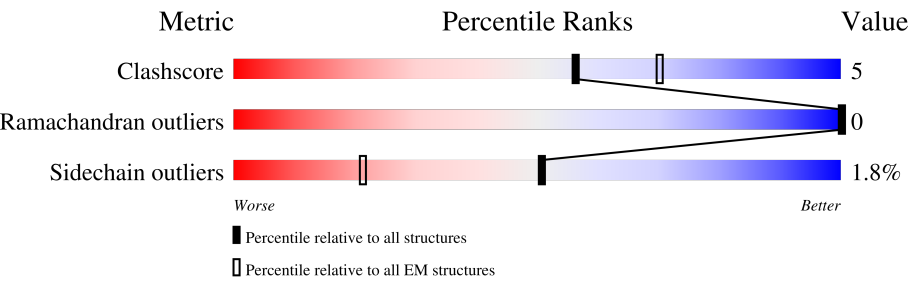
EMDB validation analysis : 0.0.1.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDb archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh &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

1 Overall quality at a glance i

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

The reported resolution of this entry is 3.12 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.






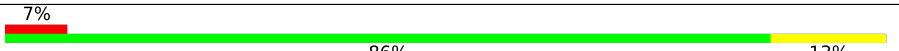
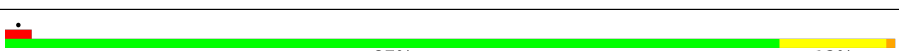
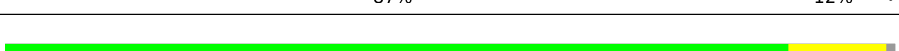
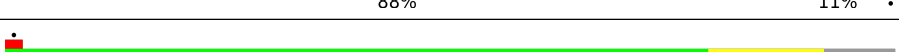
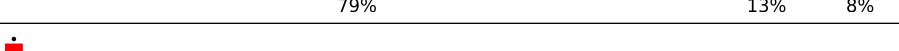
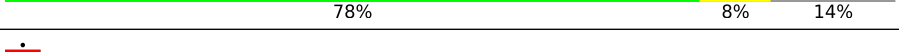
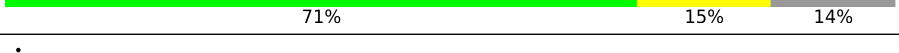


Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	14478 (2.62 - 3.62)

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	M	241	<div><div>11%</div><div>57%</div><div>10%</div><div>32%</div></div>
2	A	252	<div><div>87%</div><div>12%</div><div>.</div></div>
3	D	254	<div><div>5%</div><div>85%</div><div>13%</div><div>.</div></div>
4	E	260	<div><div>83%</div><div>12%</div><div>..</div></div>

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Mol	Chain	Length	Quality of chain
5	F	234	
6	H	215	
7	3	162	
8	4	276	
9	5	267	
10	B	250	
11	C	258	
12	G	288	
13	I	261	
14	J	205	
15	K	198	
16	L	287	

2 Entry composition

There are 16 unique types of molecules in this entry. The entry contains 27516 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called Proteasome subunit beta type-6.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	M	163	Total	C	N	O	S	0	0
			1244	793	211	236	4		

- Molecule 2 is a protein called Proteasome subunit alpha type-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	A	250	Total	C	N	O	S	0	0
			1955	1241	329	377	8		

- Molecule 3 is a protein called Proteasome subunit alpha type-4.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	D	250	Total	C	N	O	S	0	0
			1951	1217	342	387	5		

- Molecule 4 is a protein called Proteasome subunit alpha type-5.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	E	250	Total	C	N	O	S	0	0
			1929	1207	325	389	8		

- Molecule 5 is a protein called Proteasome subunit alpha type-6.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	F	234	Total	C	N	O	S	0	0
			1802	1134	313	350	5		

- Molecule 6 is a protein called Proteasome subunit beta type-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	H	170	Total	C	N	O	S	0	0
			1299	828	212	252	7		

- Molecule 7 is a protein called Proteasome maturation factor UMP1.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	3	136	Total	C	N	O	S	0	0
			1090	670	198	216	6		

There are 14 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
3	-14	ASP	-	expression tag	UNP P38293
3	-13	TYR	-	expression tag	UNP P38293
3	-12	LYS	-	expression tag	UNP P38293
3	-11	ASP	-	expression tag	UNP P38293
3	-10	ASP	-	expression tag	UNP P38293
3	-9	ASP	-	expression tag	UNP P38293
3	-8	ASP	-	expression tag	UNP P38293
3	-7	LYS	-	expression tag	UNP P38293
3	-6	HIS	-	expression tag	UNP P38293
3	-5	HIS	-	expression tag	UNP P38293
3	-4	HIS	-	expression tag	UNP P38293
3	-3	HIS	-	expression tag	UNP P38293
3	-2	HIS	-	expression tag	UNP P38293
3	-1	HIS	-	expression tag	UNP P38293

- Molecule 8 is a protein called Proteasome chaperone 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	4	276	Total	C	N	O	S	0	0
			2138	1379	336	410	13		

- Molecule 9 is a protein called Proteasome assembly chaperone 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	5	266	Total	C	N	O	S	0	0
			2161	1396	347	410	8		

- Molecule 10 is a protein called Proteasome subunit alpha type-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	B	248	Total	C	N	O	S	0	0
			1898	1208	313	374	3		

- Molecule 11 is a protein called Proteasome subunit alpha type-3.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	C	238	Total	C	N	O	S	0	0
			1868	1182	314	369	3		

- Molecule 12 is a protein called Probable proteasome subunit alpha type-7.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	G	247	Total	C	N	O	S	0	0
			1917	1218	333	362	4		

- Molecule 13 is a protein called Proteasome subunit beta type-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	I	225	Total	C	N	O	S	0	0
			1706	1070	295	335	6		

- Molecule 14 is a protein called Proteasome subunit beta type-3.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	J	191	Total	C	N	O	S	0	0
			1491	961	242	280	8		

- Molecule 15 is a protein called Proteasome subunit beta type-4.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	K	196	Total	C	N	O	S	0	0
			1564	994	263	301	6		

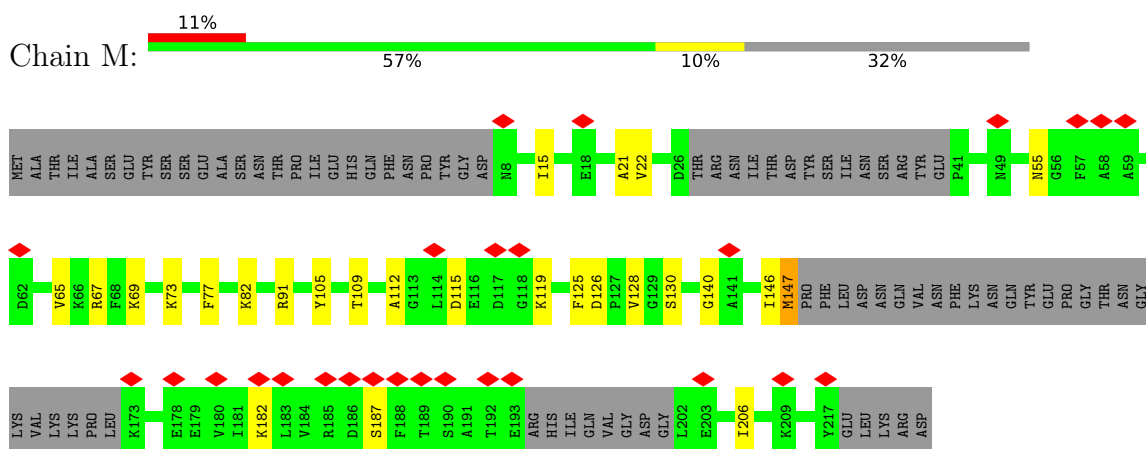
- Molecule 16 is a protein called Proteasome subunit beta type-5.

Mol	Chain	Residues	Atoms					AltConf	Trace
16	L	196	Total	C	N	O	S	0	0
			1503	958	255	282	8		

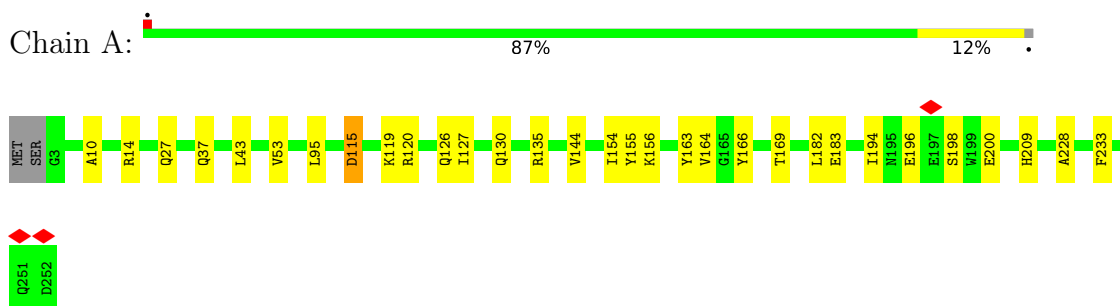
3 Residue-property plots

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

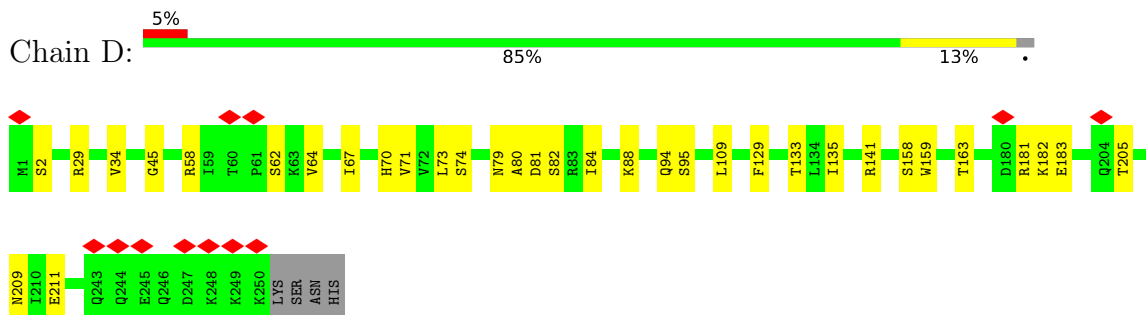
- Molecule 1: Proteasome subunit beta type-6



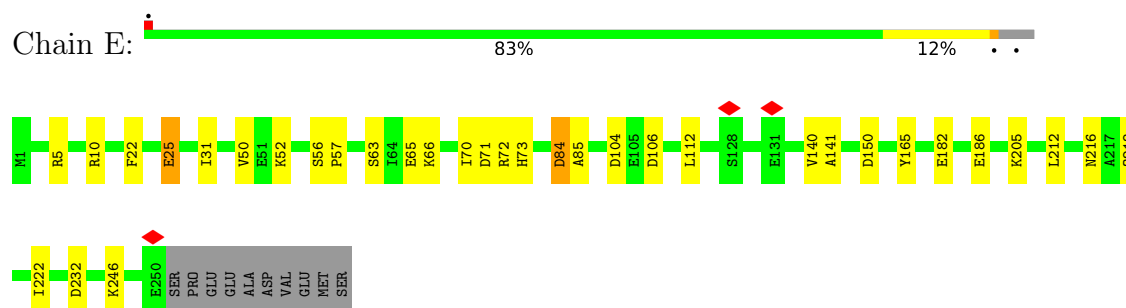
- Molecule 2: Proteasome subunit alpha type-1



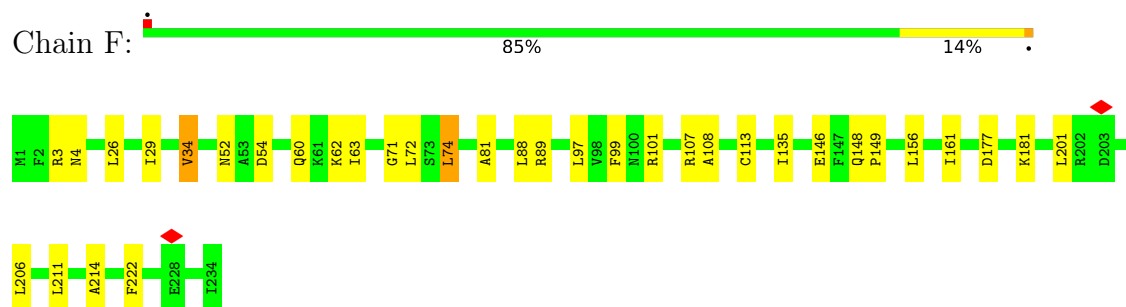
- Molecule 3: Proteasome subunit alpha type-4



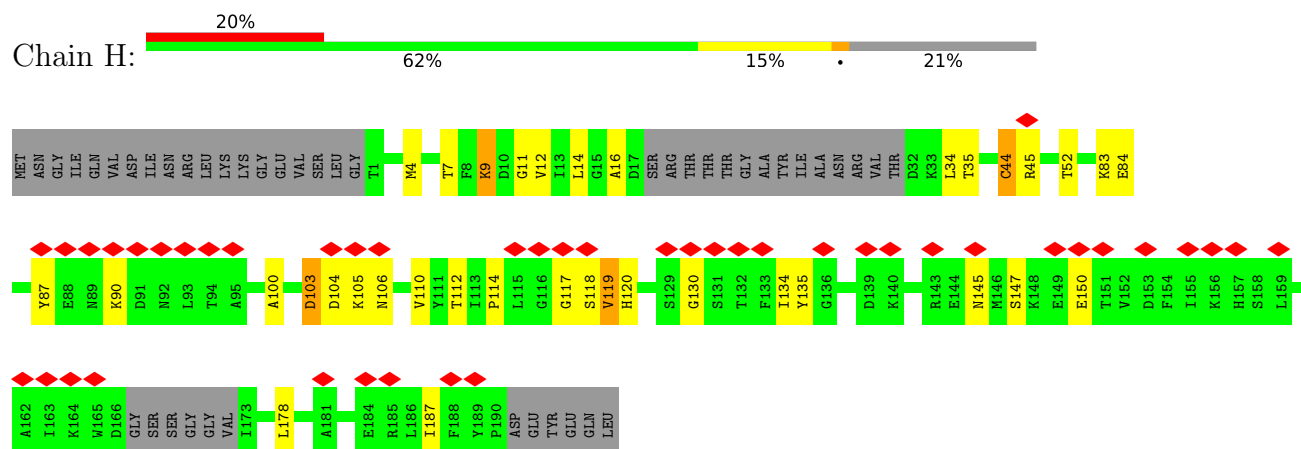
- Molecule 4: Proteasome subunit alpha type-5



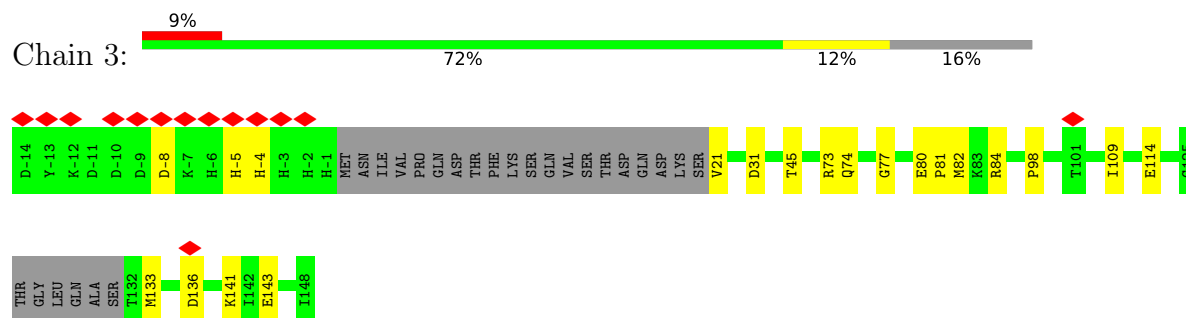
- Molecule 5: Proteasome subunit alpha type-6



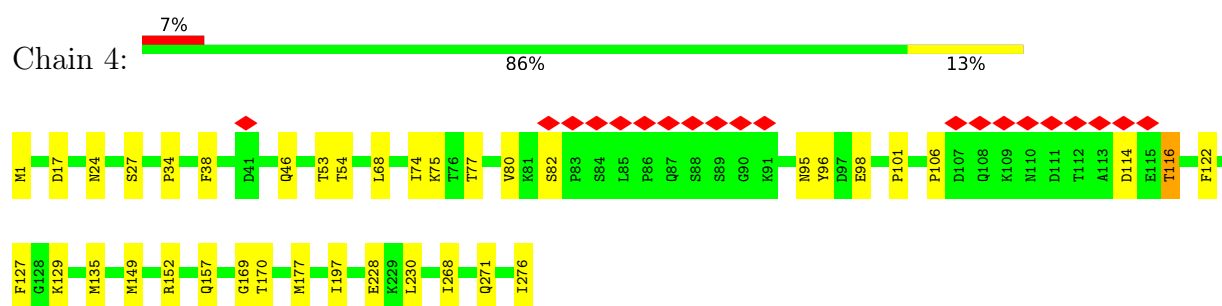
- Molecule 6: Proteasome subunit beta type-1



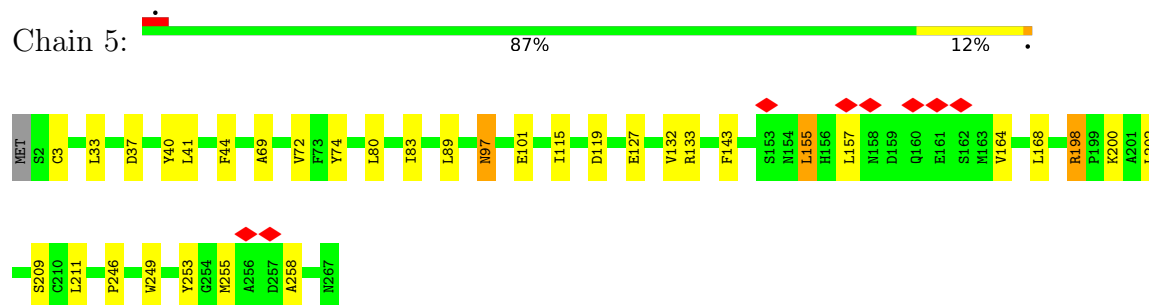
- Molecule 7: Proteasome maturation factor UMP1



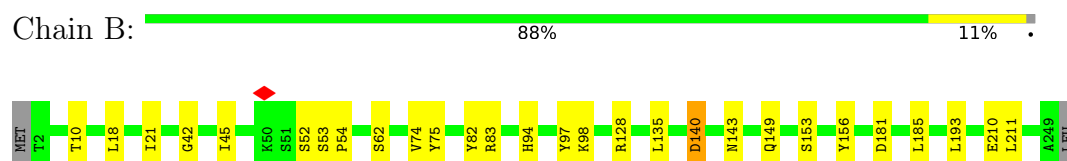
- Molecule 8: Proteasome chaperone 1



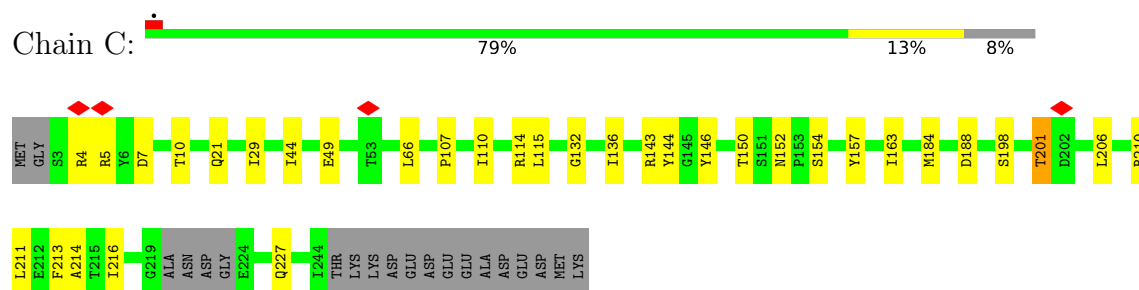
- Molecule 9: Proteasome assembly chaperone 2



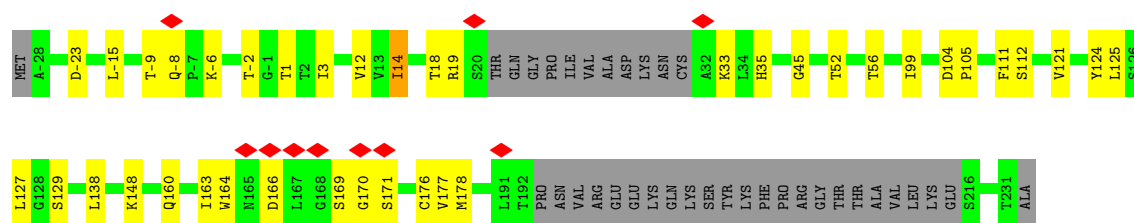
- Molecule 10: Proteasome subunit alpha type-2




- Molecule 11: Proteasome subunit alpha type-3

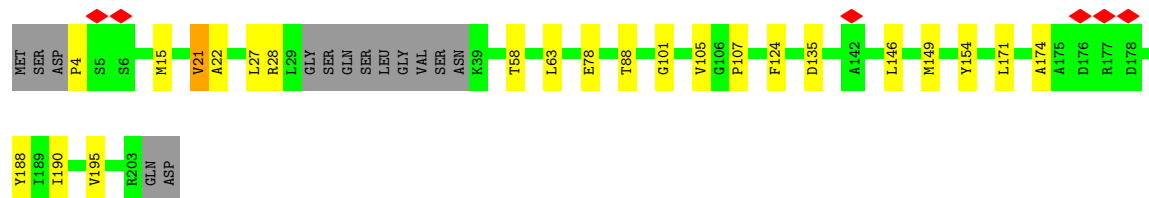


Chain I: 




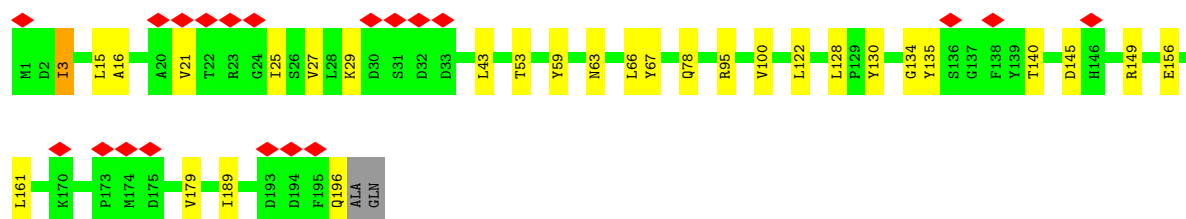
- Molecule 14: Proteasome subunit beta type-3

Chain J: 



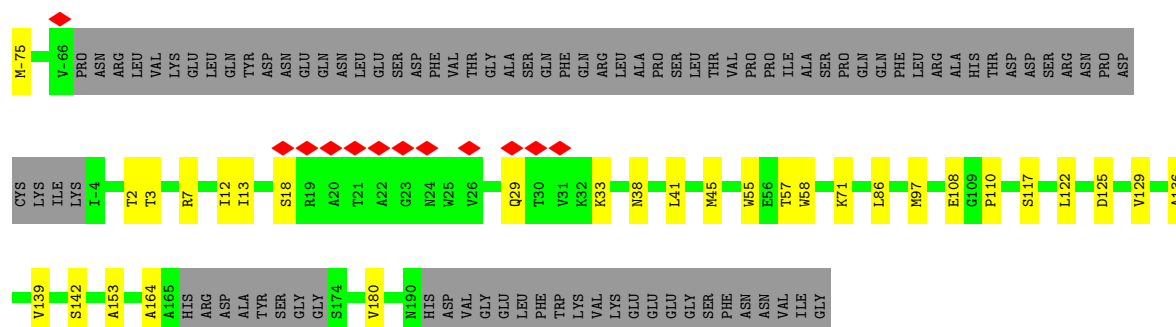
- Molecule 15: Proteasome subunit beta type-4

Chain K: 



- Molecule 16: Proteasome subunit beta type-5

Chain L: 



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	54528	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	64	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2800	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.879	Depositor
Minimum map value	-0.574	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.019	Depositor
Recommended contour level	0.128	Depositor
Map size (Å)	498.0, 498.0, 498.0	wwPDB
Map dimensions	500, 500, 500	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.996, 0.996, 0.996	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	M	0.07	0/1266	0.21	0/1705
2	A	0.12	0/1993	0.27	0/2700
3	D	0.12	0/1980	0.25	0/2679
4	E	0.11	0/1956	0.22	0/2635
5	F	0.11	0/1830	0.24	0/2473
6	H	0.09	0/1322	0.23	0/1788
7	3	0.10	0/1111	0.22	0/1503
8	4	0.10	0/2191	0.24	0/2978
9	5	0.11	0/2214	0.23	0/3010
10	B	0.12	0/1935	0.25	0/2621
11	C	0.12	0/1897	0.23	0/2566
12	G	0.12	0/1957	0.26	0/2643
13	I	0.11	0/1735	0.25	0/2353
14	J	0.12	0/1520	0.25	0/2050
15	K	0.11	0/1592	0.23	0/2147
16	L	0.10	0/1533	0.22	0/2074
All	All	0.11	0/28032	0.24	0/37925

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	M	1244	0	1196	16	0
2	A	1955	0	1943	20	0
3	D	1951	0	1952	25	0
4	E	1929	0	1904	22	0
5	F	1802	0	1809	24	0
6	H	1299	0	1277	21	0
7	3	1090	0	1029	20	0
8	4	2138	0	2107	24	0
9	5	2161	0	2115	18	0
10	B	1898	0	1906	16	0
11	C	1868	0	1872	21	0
12	G	1917	0	1909	14	0
13	I	1706	0	1676	20	0
14	J	1491	0	1495	16	0
15	K	1564	0	1566	18	0
16	L	1503	0	1476	18	0
All	All	27516	0	27232	268	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 5.

All (268) 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)
6:H:11:GLY:HA3	6:H:178:LEU:O	1.74	0.86
3:D:73:LEU:HD11	3:D:133:THR:HB	1.67	0.75
3:D:73:LEU:HD13	3:D:135:ILE:HG12	1.71	0.71
1:M:109:THR:HB	1:M:125:PHE:HB2	1.76	0.68
14:J:21:VAL:HG23	14:J:190:ILE:HB	1.75	0.67
2:A:120:ARG:NH1	7:3:114:GLU:OE2	2.27	0.67
1:M:147:MET:SD	1:M:147:MET:N	2.68	0.67
6:H:45:ARG:HD2	6:H:52:THR:HB	1.77	0.66
11:C:216:ILE:HG12	11:C:227:GLN:HG2	1.76	0.66
2:A:119:LYS:HE3	10:B:83:ARG:HD2	1.76	0.66
16:L:18:SER:HA	16:L:33:LYS:HZ2	1.60	0.66
6:H:112:THR:O	6:H:119:VAL:HA	1.96	0.65
13:I:35:HIS:HB3	13:I:56:THR:HG21	1.80	0.64
4:E:85:ALA:HB2	4:E:140:VAL:HG21	1.79	0.63
11:C:150:THR:HG21	11:C:163:ILE:HG12	1.81	0.63
13:I:18:THR:HG1	13:I:171:SER:HG	1.44	0.63
2:A:37:GLN:NE2	12:G:19:GLY:O	2.32	0.62
12:G:200:ILE:HG21	12:G:214:LEU:HD13	1.82	0.62

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
11:C:136:ILE:HG12	11:C:150:THR:HG22	1.81	0.62
6:H:118:SER:O	6:H:120:HIS:ND1	2.27	0.61
3:D:2:SER:HB2	8:4:17:ASP:HB3	1.81	0.61
11:C:143:ARG:NH2	11:C:144:TYR:OH	2.34	0.61
3:D:181:ARG:NH2	4:E:57:PRO:O	2.31	0.61
3:D:58:ARG:NH2	11:C:146:TYR:O	2.33	0.60
2:A:156:LYS:O	2:A:163:TYR:HA	2.02	0.60
4:E:205:LYS:HB2	4:E:212:LEU:HD22	1.83	0.60
6:H:147:SER:OG	6:H:150:GLU:OE1	2.19	0.60
2:A:198:SER:OG	2:A:200:GLU:OE1	2.18	0.60
8:4:230:LEU:O	8:4:271:GLN:NE2	2.34	0.59
14:J:146:LEU:HD13	14:J:174:ALA:HB2	1.84	0.59
5:F:177:ASP:O	5:F:181:LYS:NZ	2.35	0.59
11:C:7:ASP:O	11:C:21:GLN:NE2	2.36	0.59
9:5:255:MET:HB2	9:5:258:ALA:HB2	1.85	0.59
6:H:103:ASP:OD1	6:H:103:ASP:N	2.34	0.59
12:G:9:ASP:O	12:G:23:GLN:NE2	2.36	0.58
13:I:1:THR:OG1	13:I:33:LYS:NZ	2.35	0.58
3:D:79:ASN:ND2	8:4:101:PRO:O	2.36	0.58
15:K:29:LYS:HE2	16:L:122:LEU:HD11	1.86	0.58
14:J:63:LEU:HD11	14:J:105:VAL:HG21	1.85	0.58
11:C:152:ASN:ND2	11:C:154:SER:OG	2.37	0.58
2:A:127:ILE:HD11	7:3:109:ILE:HB	1.85	0.58
4:E:10:ARG:NH2	8:4:17:ASP:OD2	2.36	0.58
8:4:80:VAL:HB	8:4:116:THR:HG23	1.84	0.58
4:E:52:LYS:HE3	4:E:218:GLN:HB2	1.85	0.57
10:B:140:ASP:OD1	10:B:140:ASP:N	2.37	0.57
3:D:67:ILE:HG21	3:D:109:LEU:HD21	1.87	0.57
6:H:35:THR:OG1	6:H:45:ARG:NE	2.37	0.57
3:D:62:SER:OG	3:D:211:GLU:OE2	2.23	0.57
5:F:113:CYS:SG	12:G:86:ARG:NH1	2.78	0.57
8:4:152:ARG:NH2	9:5:37:ASP:OD1	2.34	0.56
11:C:4:ARG:O	11:C:4:ARG:NH1	2.38	0.56
4:E:31:ILE:HD13	4:E:141:ALA:HB2	1.86	0.56
6:H:9:LYS:HD3	6:H:145:ASN:HB3	1.87	0.56
13:I:148:LYS:HE3	13:I:177:VAL:HG11	1.88	0.56
15:K:179:VAL:O	15:K:196:GLN:NE2	2.39	0.56
1:M:67:ARG:NH1	1:M:105:TYR:OH	2.39	0.56
5:F:74:LEU:HD22	5:F:81:ALA:HB1	1.88	0.56
5:F:107:ARG:HD3	7:3:-5:HIS:HB2	1.87	0.55
1:M:126:ASP:OD1	1:M:130:SER:N	2.39	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
15:K:21:VAL:HG11	15:K:27:VAL:HB	1.88	0.55
4:E:71:ASP:OD1	4:E:72:ARG:N	2.37	0.55
14:J:15:MET:HE3	14:J:154:TYR:HD1	1.71	0.55
5:F:146:GLU:OE2	5:F:148:GLN:NE2	2.40	0.55
16:L:7:ARG:HD3	16:L:110:PRO:HB2	1.89	0.55
9:5:72:VAL:HG22	9:5:83:ILE:HG12	1.89	0.54
16:L:136:ALA:HB2	16:L:164:ALA:HB2	1.89	0.54
8:4:74:ILE:HB	8:4:122:PHE:HB3	1.88	0.54
8:4:75:LYS:NZ	8:4:77:THR:OG1	2.37	0.54
15:K:59:TYR:O	15:K:63:ASN:ND2	2.38	0.54
15:K:149:ARG:NH2	15:K:156:GLU:OE1	2.41	0.54
4:E:84:ASP:N	4:E:84:ASP:OD1	2.41	0.54
4:E:65:GLU:OE2	16:L:71:LYS:NZ	2.41	0.54
6:H:7:THR:HG23	6:H:110:VAL:HG23	1.90	0.53
10:B:94:HIS:HA	10:B:98:LYS:HB3	1.90	0.53
12:G:190:ARG:NH2	12:G:223:GLU:OE1	2.42	0.53
14:J:107:PRO:HG2	14:J:124:PHE:HB2	1.91	0.53
13:I:2:THR:HB	13:I:33:LYS:HE2	1.89	0.52
16:L:33:LYS:HA	16:L:45:MET:HE2	1.91	0.52
3:D:81:ASP:HB3	3:D:129:PHE:HD1	1.74	0.52
5:F:107:ARG:NH1	7:3:-5:HIS:O	2.43	0.52
9:5:119:ASP:O	9:5:209:SER:HA	2.09	0.52
3:D:205:THR:OG1	3:D:209:ASN:OD1	2.20	0.52
1:M:22:VAL:HG12	1:M:206:ILE:HG13	1.91	0.52
5:F:3:ARG:HB2	9:5:253:TYR:HA	1.92	0.52
6:H:14:LEU:HD11	6:H:44:CYS:HB2	1.93	0.51
16:L:38:ASN:OD1	16:L:41:LEU:N	2.43	0.51
2:A:135:ARG:HD3	12:G:13:SER:HB2	1.92	0.51
13:I:45:GLY:HA3	13:I:52:THR:HG21	1.91	0.51
10:B:74:VAL:HG12	10:B:135:LEU:HB2	1.92	0.51
2:A:43:LEU:HD11	2:A:182:LEU:HD11	1.93	0.51
13:I:112:SER:HB3	13:I:125:LEU:HD13	1.93	0.51
14:J:149:MET:HE1	14:J:174:ALA:HA	1.92	0.51
7:3:45:THR:HG21	15:K:95:ARG:HH12	1.76	0.51
7:3:80:GLU:HB3	7:3:81:PRO:HD3	1.93	0.51
6:H:45:ARG:NH1	6:H:52:THR:OG1	2.43	0.51
10:B:97:TYR:OH	14:J:78:GLU:OE2	2.20	0.51
2:A:10:ALA:O	2:A:14:ARG:NH2	2.44	0.50
2:A:194:ILE:HG22	2:A:196:GLU:HG2	1.93	0.50
16:L:97:MET:H	16:L:117:SER:HB3	1.76	0.50
7:3:-5:HIS:O	7:3:-5:HIS:ND1	2.43	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:52:LYS:HB2	4:E:216:ASN:HA	1.94	0.50
4:E:73:HIS:CE1	4:E:106:ASP:HB3	2.46	0.50
8:4:95:ASN:ND2	8:4:98:GLU:OE1	2.39	0.50
12:G:87:HIS:O	12:G:91:ARG:HG2	2.10	0.50
5:F:34:VAL:HA	5:F:161:ILE:O	2.12	0.50
7:3:80:GLU:O	7:3:84:ARG:HG2	2.11	0.50
8:4:169:GLY:HA3	8:4:197:ILE:HG13	1.93	0.50
5:F:62:LYS:HE3	8:4:276:ILE:HG22	1.94	0.50
6:H:12:VAL:HG12	6:H:178:LEU:HB2	1.94	0.50
8:4:82:SER:OG	8:4:114:ASP:O	2.29	0.50
11:C:44:ILE:HD11	11:C:146:TYR:HB3	1.93	0.50
3:D:94:GLN:HG3	15:K:66:LEU:HB2	1.94	0.50
10:B:62:SER:OG	10:B:210:GLU:OE2	2.27	0.50
11:C:107:PRO:HD2	11:C:110:ILE:HD12	1.94	0.50
7:3:-8:ASP:HA	7:3:-5:HIS:NE2	2.27	0.49
16:L:55:TRP:CE3	16:L:86:LEU:HD21	2.47	0.49
15:K:130:TYR:OH	15:K:145:ASP:OD1	2.22	0.49
15:K:53:THR:HG23	15:K:100:VAL:HG23	1.95	0.49
12:G:246:GLU:HG2	12:G:247:ILE:HG13	1.95	0.49
13:I:111:PHE:HD1	13:I:121:VAL:HG22	1.78	0.49
2:A:14:ARG:O	2:A:27:GLN:NE2	2.45	0.49
5:F:72:LEU:HD23	5:F:88:LEU:HD23	1.95	0.49
5:F:206:LEU:HD22	5:F:211:LEU:HD13	1.94	0.49
11:C:10:THR:HG22	11:C:21:GLN:HG3	1.95	0.49
16:L:7:ARG:NH2	16:L:125:ASP:OD1	2.45	0.48
9:5:115:ILE:HG22	9:5:202:LEU:HD11	1.94	0.48
6:H:16:ALA:HB3	6:H:34:LEU:HD11	1.95	0.48
15:K:43:LEU:HD13	15:K:189:ILE:HD13	1.95	0.48
11:C:206:LEU:HD11	11:C:211:LEU:HD21	1.96	0.48
7:3:133:MET:HE1	15:K:67:TYR:HB2	1.95	0.48
10:B:10:THR:HG22	10:B:18:LEU:HD22	1.96	0.48
16:L:2:THR:HA	16:L:129:VAL:O	2.14	0.48
2:A:126:GLN:NE2	2:A:130:GLN:OE1	2.43	0.48
2:A:228:ALA:HB2	2:A:233:PHE:HD2	1.78	0.48
10:B:42:GLY:HA3	10:B:185:LEU:HD13	1.94	0.48
3:D:64:VAL:HG22	3:D:74:SER:HB3	1.95	0.48
1:M:115:ASP:OD1	1:M:119:LYS:N	2.46	0.47
6:H:114:PRO:HD2	6:H:118:SER:H	1.79	0.47
2:A:115:ASP:OD1	2:A:115:ASP:N	2.38	0.47
5:F:71:GLY:HA3	5:F:222:PHE:CE1	2.49	0.47
12:G:220:SER:HB3	12:G:223:GLU:HB2	1.96	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
12:G:44:ASP:OD1	12:G:44:ASP:N	2.47	0.47
6:H:84:GLU:OE2	7:3:74:GLN:NE2	2.44	0.47
9:5:155:LEU:O	9:5:157:LEU:N	2.47	0.47
7:3:98:PRO:O	7:3:141:LYS:NZ	2.41	0.47
13:I:14:ILE:HG23	13:I:176:CYS:HB3	1.97	0.47
3:D:79:ASN:O	3:D:82:SER:OG	2.25	0.47
4:E:70:ILE:HG21	4:E:112:LEU:HD21	1.96	0.47
4:E:22:PHE:HA	4:E:25:GLU:HG3	1.96	0.46
7:3:136:ASP:HB3	11:C:114:ARG:HH22	1.80	0.46
12:G:214:LEU:HD21	12:G:216:ILE:HD11	1.98	0.46
1:M:65:VAL:HG12	1:M:69:LYS:HE2	1.98	0.46
10:B:149:GLN:O	10:B:156:TYR:HA	2.15	0.46
1:M:15:ILE:HB	1:M:22:VAL:HG23	1.97	0.46
3:D:29:ARG:NH1	8:4:96:TYR:OH	2.48	0.46
14:J:190:ILE:HG23	14:J:195:VAL:HG22	1.97	0.46
8:4:122:PHE:HE1	8:4:135:MET:HB2	1.80	0.46
13:I:160:GLN:HE21	13:I:164:TRP:HE1	1.64	0.46
16:L:13:ILE:HG13	16:L:153:ALA:HB1	1.97	0.46
7:3:73:ARG:HA	7:3:77:GLY:O	2.15	0.46
14:J:4:PRO:HG2	15:K:128:LEU:HD22	1.97	0.46
2:A:120:ARG:NH2	7:3:109:ILE:O	2.48	0.46
5:F:88:LEU:HD11	5:F:108:ALA:HB1	1.97	0.46
7:3:82:MET:HE3	16:L:-75:MET:HE2	1.97	0.46
7:3:136:ASP:HB3	11:C:114:ARG:NH2	2.31	0.46
9:5:3:CYS:HB3	9:5:80:LEU:HD22	1.98	0.46
14:J:88:THR:HG23	14:J:124:PHE:CZ	2.51	0.46
10:B:21:ILE:HG21	10:B:153:SER:HB3	1.98	0.46
8:4:68:LEU:HD23	8:4:127:PHE:HB3	1.98	0.46
9:5:132:VAL:HG23	9:5:133:ARG:HG3	1.98	0.45
4:E:165:TYR:OH	5:F:60:GLN:NE2	2.46	0.45
5:F:52:ASN:ND2	5:F:54:ASP:O	2.49	0.45
6:H:130:GLY:O	6:H:134:ILE:HG12	2.16	0.45
7:3:80:GLU:OE2	7:3:84:ARG:NH2	2.48	0.45
5:F:99:PHE:HB3	5:F:101:ARG:HD3	1.97	0.45
9:5:127:GLU:OE1	9:5:127:GLU:N	2.48	0.45
3:D:29:ARG:HD2	8:4:106:PRO:HD3	1.99	0.45
6:H:83:LYS:HE3	6:H:117:GLY:HA3	1.99	0.45
12:G:193:VAL:HG13	12:G:216:ILE:HG21	1.99	0.45
5:F:63:ILE:HG21	5:F:214:ALA:HB2	1.99	0.45
14:J:135:ASP:OD1	14:J:135:ASP:N	2.46	0.45
4:E:50:VAL:HG21	4:E:66:LYS:HB2	1.97	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:B:75:TYR:HB3	10:B:82:TYR:CD1	2.52	0.45
13:I:163:ILE:HD13	13:I:170:GLY:HA2	1.99	0.45
10:B:140:ASP:OD2	10:B:143:ASN:ND2	2.50	0.45
6:H:12:VAL:HG11	6:H:100:ALA:HB1	1.99	0.44
11:C:198:SER:O	11:C:201:THR:OG1	2.34	0.44
13:I:124:TYR:HB2	13:I:138:LEU:HD13	2.00	0.44
8:4:46:GLN:O	8:4:129:LYS:NZ	2.41	0.44
8:4:170:THR:OG1	8:4:228:GLU:OE1	2.29	0.44
9:5:246:PRO:HG2	9:5:249:TRP:CD1	2.53	0.44
8:4:24:ASN:ND2	8:4:27:SER:OG	2.51	0.44
5:F:29:ILE:HD11	5:F:149:PRO:HD3	2.00	0.44
13:I:12:VAL:HG13	13:I:178:MET:HE3	2.00	0.44
15:K:15:LEU:HD12	15:K:43:LEU:HD23	1.99	0.44
15:K:16:ALA:HB2	15:K:161:LEU:HD21	1.99	0.44
3:D:80:ALA:O	3:D:84:ILE:HG12	2.18	0.43
3:D:88:LYS:NZ	7:3:143:GLU:OE2	2.38	0.43
8:4:177:MET:HE2	8:4:177:MET:HB3	1.74	0.43
1:M:21:ALA:HB1	1:M:112:ALA:HB1	2.00	0.43
8:4:53:THR:OG1	8:4:54:THR:N	2.50	0.43
16:L:12:ILE:HB	16:L:180:VAL:HB	2.01	0.43
5:F:135:ILE:HD11	5:F:222:PHE:HE1	1.84	0.43
13:I:3:ILE:HG22	13:I:99:ILE:HD12	2.01	0.43
14:J:171:LEU:HD23	14:J:171:LEU:HA	1.90	0.43
1:M:77:PHE:O	5:F:89:ARG:NH2	2.52	0.43
2:A:115:ASP:HB3	2:A:155:TYR:CZ	2.54	0.43
5:F:201:LEU:HD11	5:F:206:LEU:HG	2.00	0.43
10:B:193:LEU:HD21	10:B:211:LEU:HD11	2.01	0.43
14:J:28:ARG:H	14:J:28:ARG:HG3	1.66	0.43
3:D:159:TRP:HZ3	4:E:56:SER:HB3	1.84	0.43
11:C:29:ILE:HD11	11:C:132:GLY:C	2.44	0.43
9:5:33:LEU:HD22	9:5:74:TYR:HB2	2.01	0.42
8:4:34:PRO:HG2	8:4:149:MET:HG3	2.01	0.42
1:M:73:LYS:HD2	5:F:97:LEU:HD13	2.01	0.42
3:D:45:GLY:HA2	3:D:211:GLU:O	2.20	0.42
9:5:143:PHE:HB2	9:5:168:LEU:HD23	2.01	0.42
9:5:44:PHE:HB3	9:5:69:ALA:HB2	2.00	0.42
11:C:115:LEU:HD23	11:C:115:LEU:HA	1.85	0.42
2:A:164:VAL:HG13	2:A:166:TYR:CE1	2.55	0.42
4:E:182:GLU:O	4:E:186:GLU:HB2	2.20	0.42
9:5:97:ASN:OD1	9:5:97:ASN:N	2.52	0.42
14:J:22:ALA:HA	14:J:188:TYR:O	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
15:K:135:TYR:OH	15:K:140:THR:OG1	2.29	0.42
8:4:268:ILE:HD12	8:4:271:GLN:HB2	2.02	0.41
12:G:205:GLU:C	12:G:207:ASN:H	2.28	0.41
15:K:3:ILE:HA	15:K:134:GLY:HA3	2.01	0.41
10:B:52:SER:OG	10:B:53:SER:N	2.52	0.41
11:C:184:MET:HG3	11:C:188:ASP:HB2	2.02	0.41
13:I:-15:LEU:HD21	15:K:122:LEU:HD11	2.03	0.41
13:I:129:SER:OG	13:I:166:ASP:OD2	2.31	0.41
1:M:55:ASN:ND2	1:M:140:GLY:HA2	2.36	0.41
4:E:5:ARG:O	5:F:4:ASN:ND2	2.49	0.41
10:B:181:ASP:OD1	10:B:181:ASP:N	2.52	0.41
14:J:146:LEU:HA	14:J:149:MET:HE3	2.02	0.41
16:L:58:TRP:CZ3	16:L:86:LEU:HD22	2.55	0.41
2:A:183:GLU:OE2	10:B:54:PRO:HD2	2.21	0.41
6:H:103:ASP:OD2	6:H:106:ASN:ND2	2.54	0.41
3:D:95:SER:OG	7:3:31:ASP:OD1	2.35	0.41
9:5:198:ARG:H	9:5:198:ARG:HG3	1.64	0.41
12:G:87:HIS:NE2	12:G:119:TYR:OH	2.46	0.41
1:M:91:ARG:NH1	16:L:57:THR:HG21	2.36	0.41
2:A:95:LEU:HD23	2:A:95:LEU:HA	1.94	0.41
5:F:26:LEU:HD23	5:F:149:PRO:HG2	2.02	0.41
11:C:150:THR:O	11:C:157:TYR:HA	2.21	0.41
6:H:4:MET:HE3	6:H:4:MET:HB2	1.90	0.41
13:I:-23:ASP:O	14:J:101:GLY:HA3	2.21	0.41
3:D:141:ARG:NH1	16:L:108:GLU:HG2	2.36	0.41
11:C:66:LEU:HD13	11:C:214:ALA:HB2	2.03	0.41
13:I:19:ARG:HB3	13:I:169:SER:HA	2.03	0.41
15:K:21:VAL:HG12	15:K:29:LYS:HE3	2.03	0.41
16:L:139:VAL:O	16:L:142:SER:OG	2.29	0.41
9:5:40:TYR:OH	9:5:101:GLU:OE1	2.36	0.41
13:I:104:ASP:HB2	13:I:105:PRO:HD2	2.02	0.41
13:I:127:LEU:HD12	13:I:127:LEU:HA	1.95	0.41
1:M:91:ARG:HE	4:E:104:ASP:HB2	1.86	0.40
4:E:232:ASP:OD1	4:E:232:ASP:N	2.51	0.40
1:M:146:ILE:HG12	1:M:187:SER:HB2	2.03	0.40
3:D:34:VAL:HG13	3:D:163:THR:HG22	2.02	0.40
6:H:104:ASP:OD1	6:H:105:LYS:N	2.54	0.40
1:M:82:LYS:NZ	4:E:150:ASP:OD2	2.51	0.40
8:4:38:PHE:CG	8:4:157:GLN:HG3	2.56	0.40
11:C:49:GLU:OE2	11:C:210:ARG:NH2	2.54	0.40
2:A:144:VAL:HG12	2:A:154:ILE:HG12	2.04	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:D:158:SER:HB3	4:E:63:SER:HB3	2.03	0.40
3:D:182:LYS:HG3	3:D:183:GLU:HG3	2.04	0.40
9:5:41:LEU:HD23	9:5:89:LEU:HD23	2.03	0.40
3:D:70:HIS:CD2	3:D:71:VAL:HG23	2.57	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	M	155/241 (64%)	152 (98%)	3 (2%)	0	100	100
2	A	248/252 (98%)	240 (97%)	8 (3%)	0	100	100
3	D	248/254 (98%)	245 (99%)	3 (1%)	0	100	100
4	E	248/260 (95%)	247 (100%)	1 (0%)	0	100	100
5	F	232/234 (99%)	226 (97%)	6 (3%)	0	100	100
6	H	164/215 (76%)	157 (96%)	7 (4%)	0	100	100
7	3	130/162 (80%)	127 (98%)	3 (2%)	0	100	100
8	4	274/276 (99%)	263 (96%)	11 (4%)	0	100	100
9	5	264/267 (99%)	254 (96%)	10 (4%)	0	100	100
10	B	246/250 (98%)	244 (99%)	2 (1%)	0	100	100
11	C	234/258 (91%)	228 (97%)	6 (3%)	0	100	100
12	G	245/288 (85%)	235 (96%)	10 (4%)	0	100	100
13	I	219/261 (84%)	215 (98%)	4 (2%)	0	100	100
14	J	187/205 (91%)	182 (97%)	5 (3%)	0	100	100
15	K	194/198 (98%)	187 (96%)	7 (4%)	0	100	100
16	L	190/287 (66%)	183 (96%)	7 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	3478/3908 (89%)	3385 (97%)	93 (3%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	M	126/201 (63%)	123 (98%)	3 (2%)	43	67
2	A	208/210 (99%)	204 (98%)	4 (2%)	50	71
3	D	218/226 (96%)	218 (100%)	0	100	100
4	E	205/215 (95%)	201 (98%)	4 (2%)	48	70
5	F	193/193 (100%)	190 (98%)	3 (2%)	55	73
6	H	138/178 (78%)	130 (94%)	8 (6%)	18	46
7	3	122/150 (81%)	120 (98%)	2 (2%)	55	73
8	4	243/251 (97%)	241 (99%)	2 (1%)	73	80
9	5	243/244 (100%)	237 (98%)	6 (2%)	42	66
10	B	207/209 (99%)	204 (99%)	3 (1%)	59	74
11	C	200/216 (93%)	197 (98%)	3 (2%)	57	73
12	G	204/239 (85%)	201 (98%)	3 (2%)	57	73
13	I	183/214 (86%)	179 (98%)	4 (2%)	45	68
14	J	161/173 (93%)	158 (98%)	3 (2%)	50	71
15	K	173/175 (99%)	170 (98%)	3 (2%)	53	72
16	L	154/235 (66%)	152 (99%)	2 (1%)	61	75
All	All	2978/3329 (90%)	2925 (98%)	53 (2%)	51	71

All (53) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	M	128	VAL

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	M	147	MET
1	M	182	LYS
2	A	53	VAL
2	A	115	ASP
2	A	169	THR
2	A	209	HIS
4	E	25	GLU
4	E	84	ASP
4	E	222	ILE
4	E	246	LYS
5	F	34	VAL
5	F	74	LEU
5	F	156	LEU
6	H	9	LYS
6	H	44	CYS
6	H	87	TYR
6	H	90	LYS
6	H	103	ASP
6	H	119	VAL
6	H	135	TYR
6	H	187	ILE
7	3	-4	HIS
7	3	21	VAL
8	4	1	MET
8	4	116	THR
9	5	97	ASN
9	5	155	LEU
9	5	164	VAL
9	5	198	ARG
9	5	200	LYS
9	5	211	LEU
10	B	45	ILE
10	B	128	ARG
10	B	140	ASP
11	C	5	ARG
11	C	201	THR
11	C	213	PHE
12	G	55	THR
12	G	208	LYS
12	G	235	LEU
13	I	-9	THR
13	I	-8	GLN

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
13	I	-6	LYS
13	I	14	ILE
14	J	21	VAL
14	J	27	LEU
14	J	58	THR
15	K	3	ILE
15	K	25	ILE
15	K	78	GLN
16	L	3	THR
16	L	29	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (25) such sidechains are listed below:

Mol	Chain	Res	Type
2	A	37	GLN
4	E	147	HIS
4	E	157	HIS
4	E	180	GLN
6	H	69	GLN
6	H	106	ASN
8	4	58	ASN
10	B	190	HIS
11	C	59	GLN
11	C	152	ASN
11	C	156	ASN
11	C	168	ASN
12	G	33	ASN
12	G	207	ASN
13	I	-10	HIS
13	I	93	HIS
13	I	160	GLN
13	I	189	ASN
15	K	101	ASN
15	K	118	GLN
16	L	-74	GLN
16	L	62	GLN
16	L	66	HIS
16	L	89	GLN
16	L	133	GLN

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 [i](#)

There are no chain breaks in this entry.

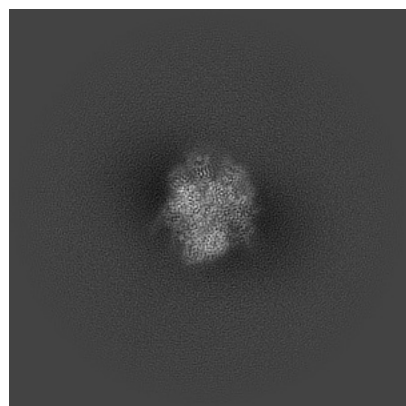
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-54046. These allow visual inspection of the internal detail of the map and identification of artifacts.

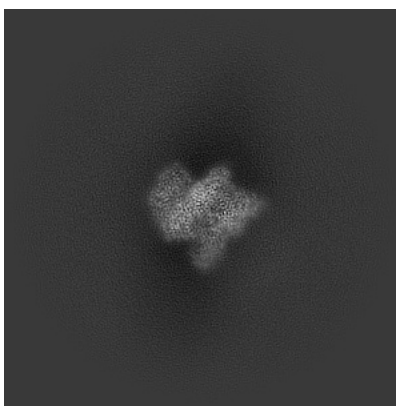
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

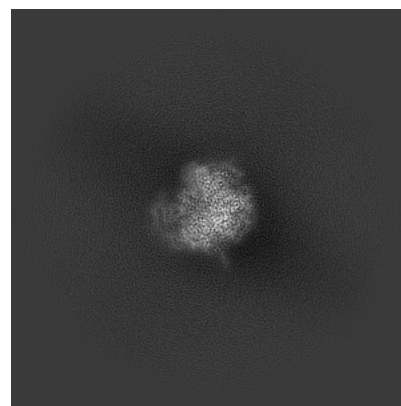
6.1.1 Primary map



X

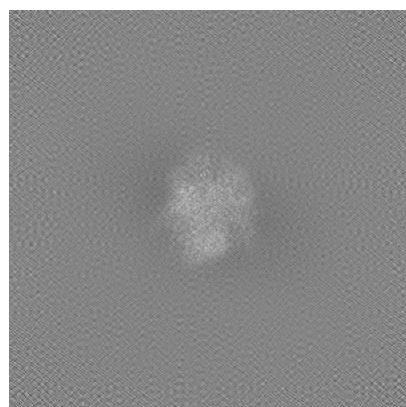


Y

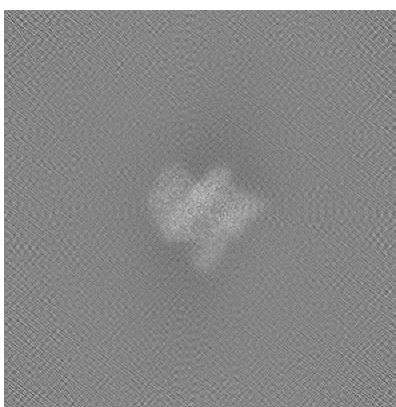


Z

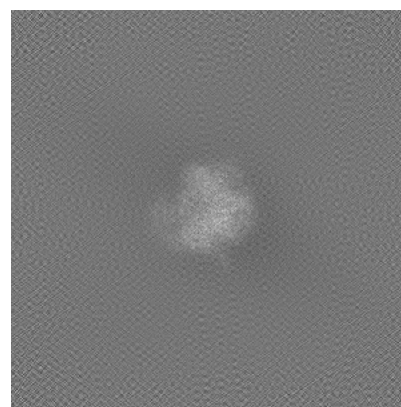
6.1.2 Raw map



X



Y

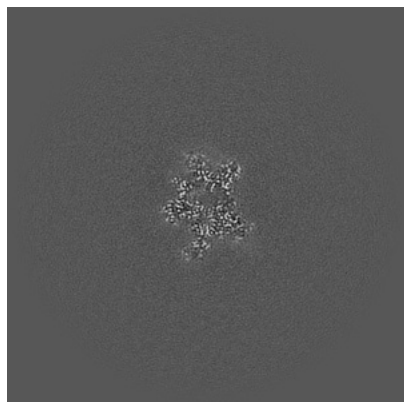


Z

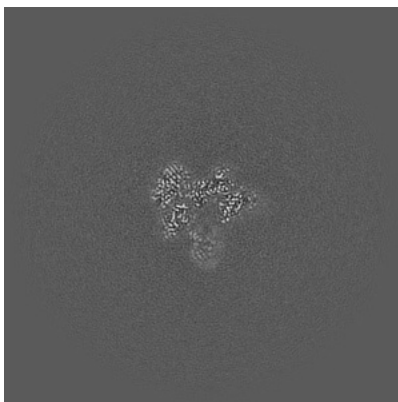
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

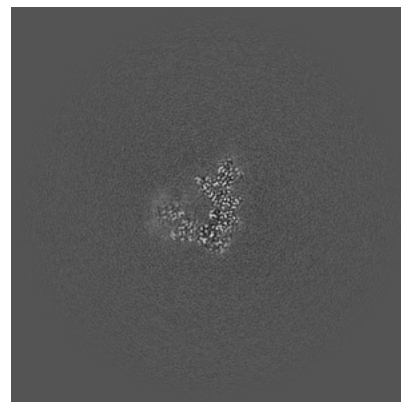
6.2.1 Primary map



X Index: 250

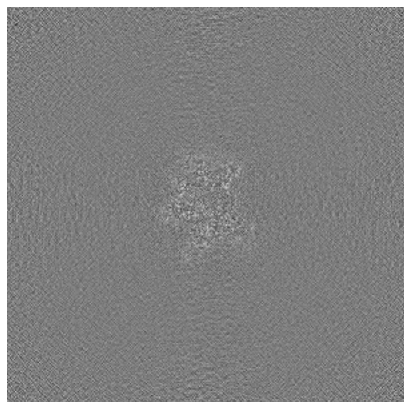


Y Index: 250

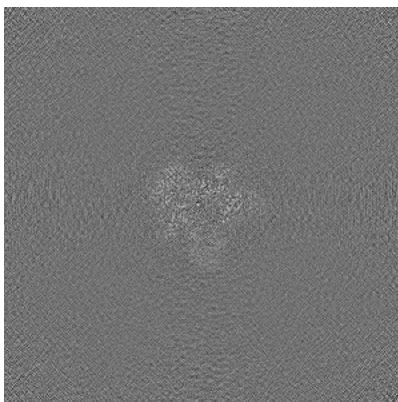


Z Index: 250

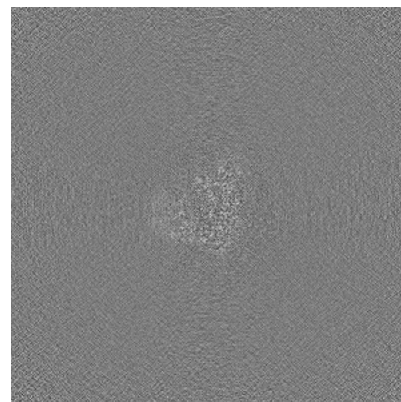
6.2.2 Raw map



X Index: 250



Y Index: 250

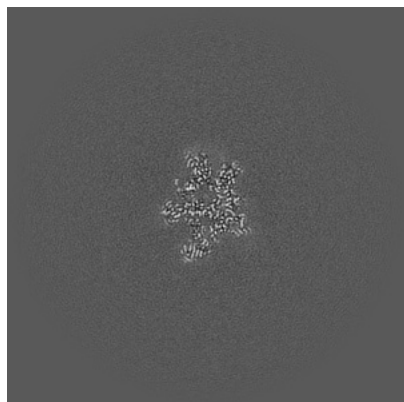


Z Index: 250

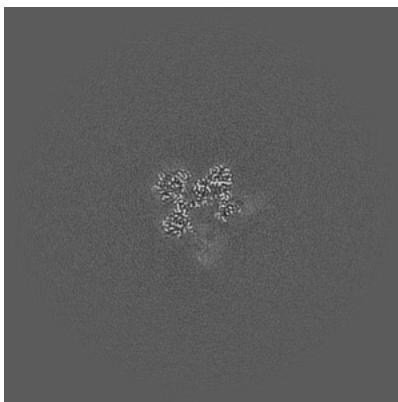
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

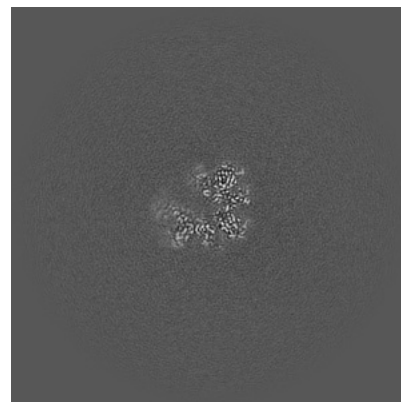
6.3.1 Primary map



X Index: 256

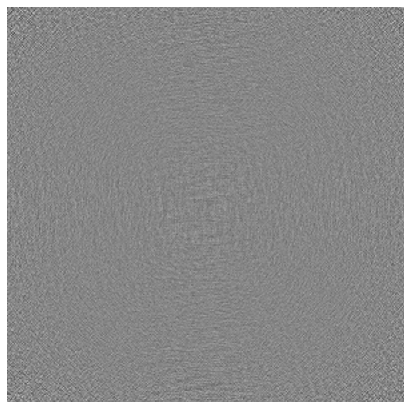


Y Index: 256

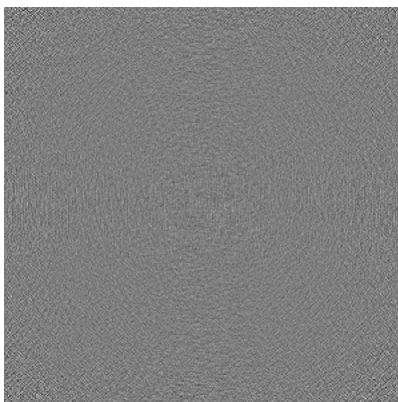


Z Index: 258

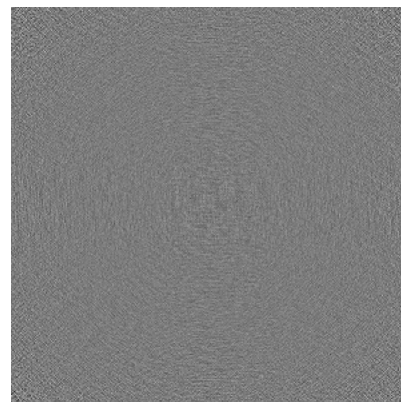
6.3.2 Raw map



X Index: 0



Y Index: 0

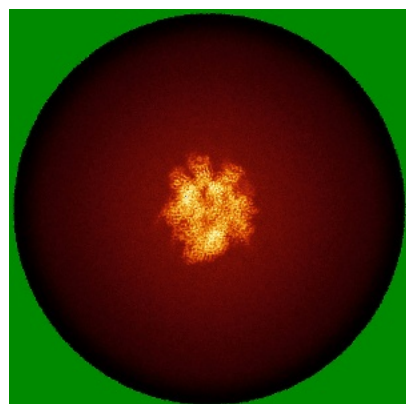


Z Index: 499

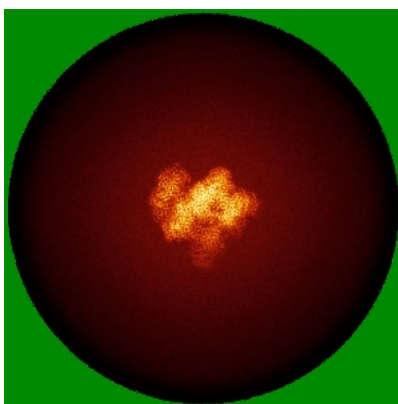
The images above show the largest variance slices of the map in three orthogonal directions.

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

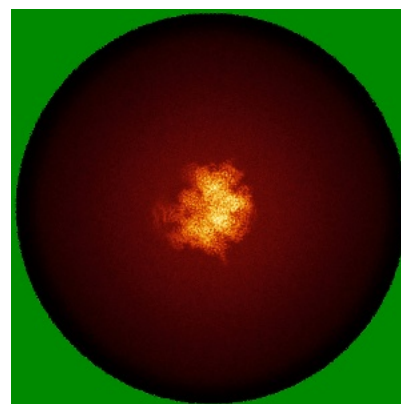
6.4.1 Primary map



X

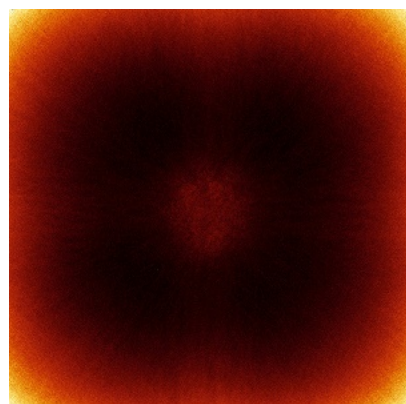


Y

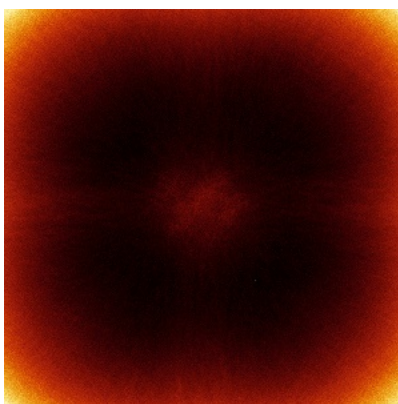


Z

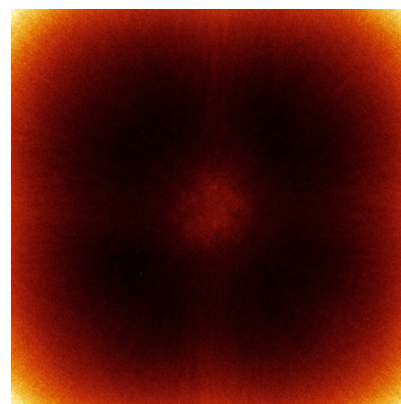
6.4.2 Raw map



X



Y

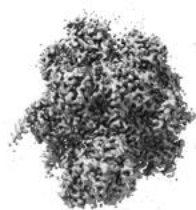


Z

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



X



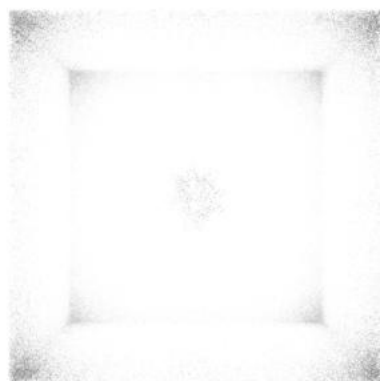
Y



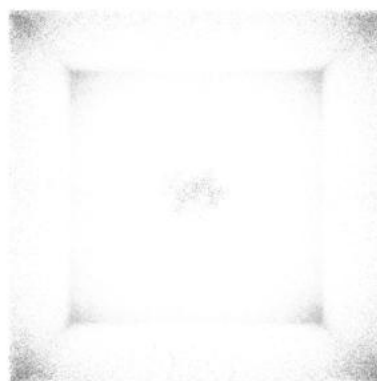
Z

The images above show the 3D surface view of the map at the recommended contour level 0.128. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

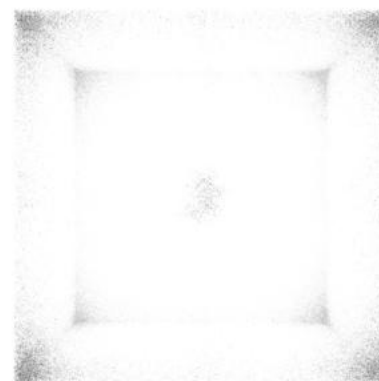
6.5.2 Raw map



X



Y



Z

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.

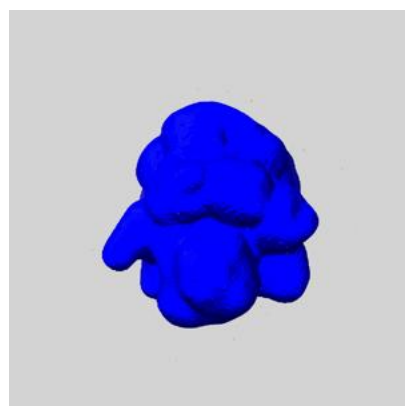
6.6 Mask visualisation [i](#)

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

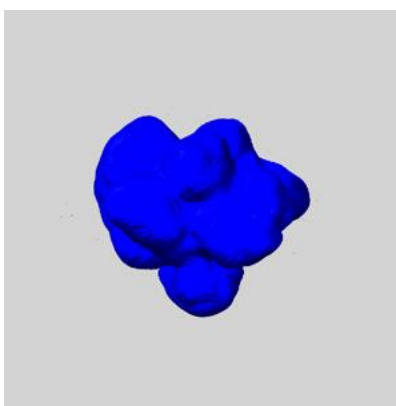
A mask typically either:

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

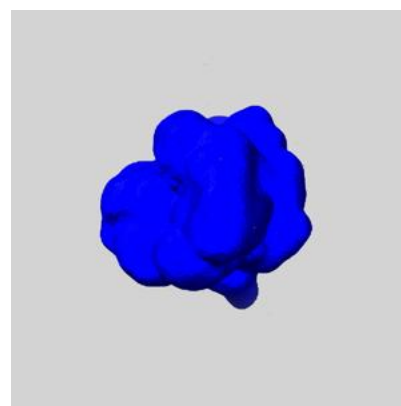
6.6.1 emd_54046_msk_1.map [i](#)



X



Y

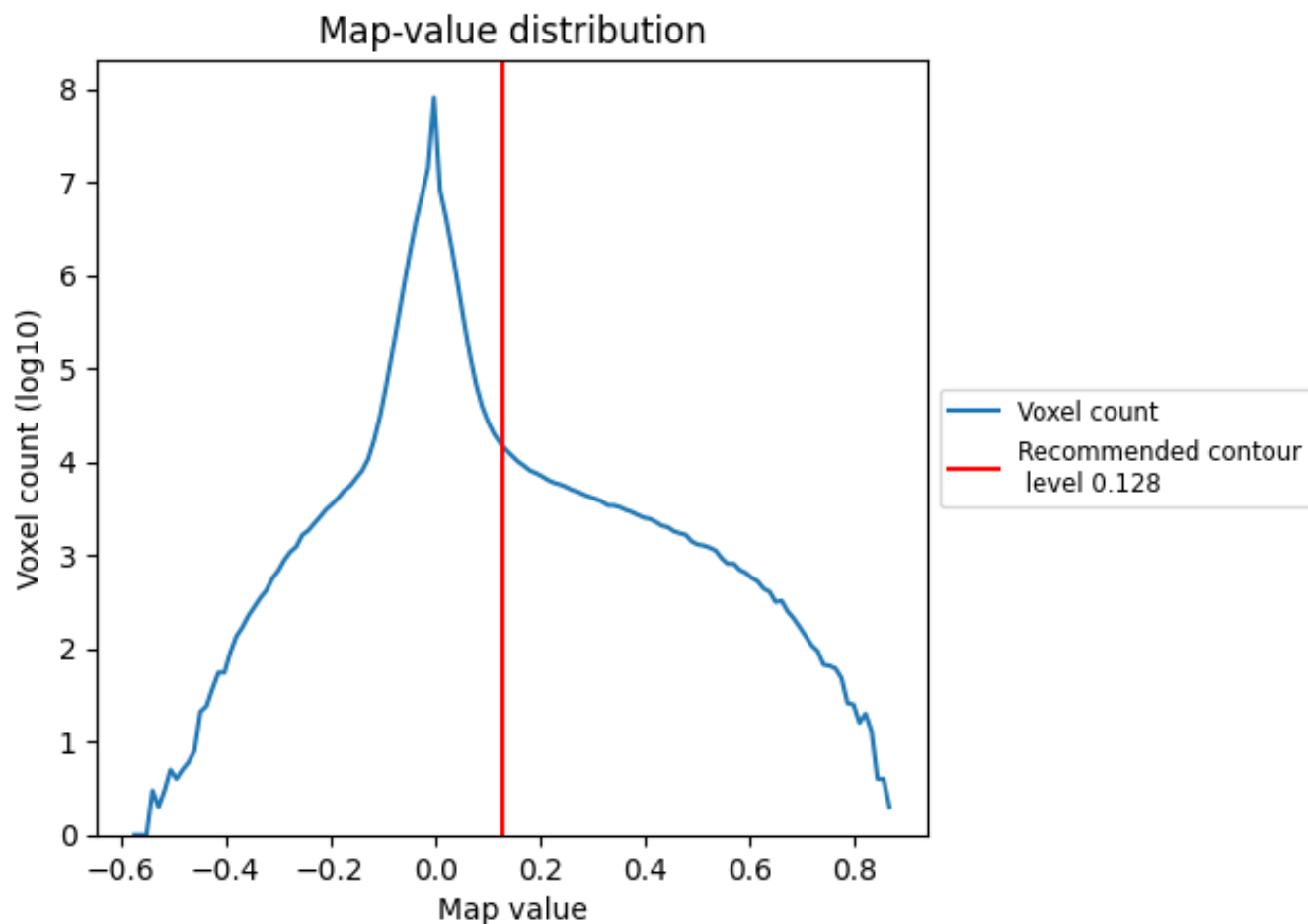


Z

7 Map analysis [i](#)

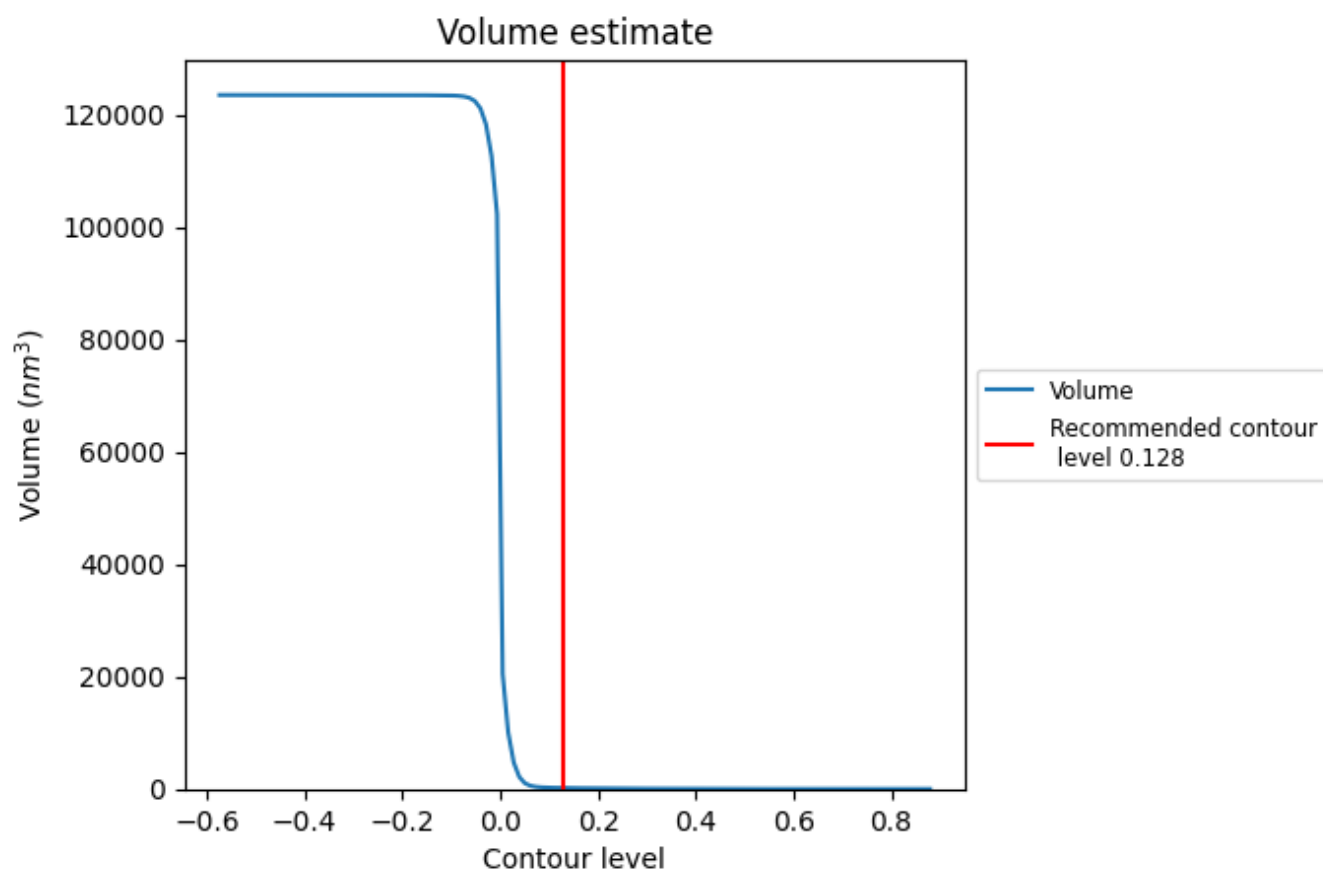
This section contains the results of statistical analysis of the map.

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.

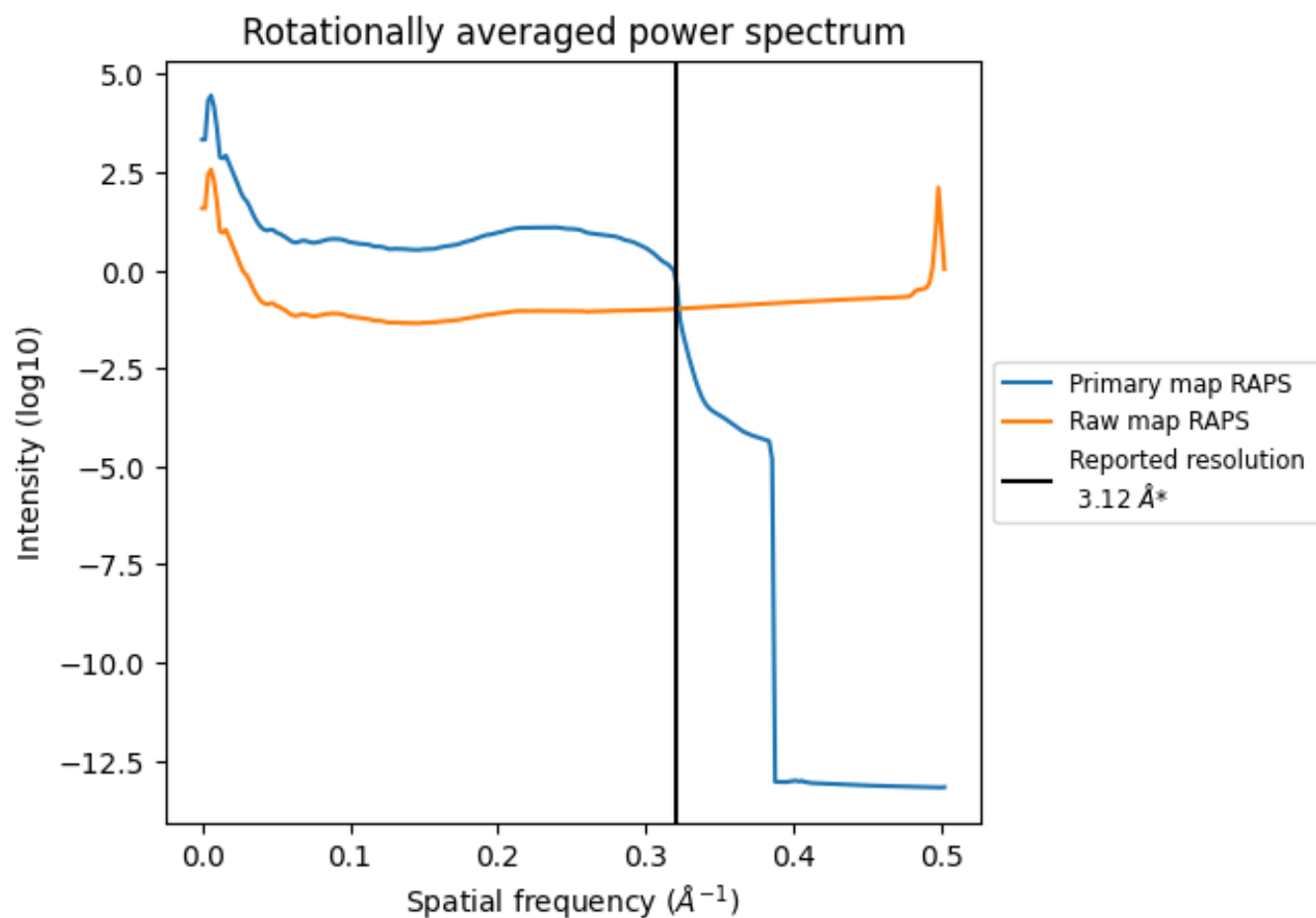
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 174 nm³; this corresponds to an approximate mass of 158 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 ⓘ

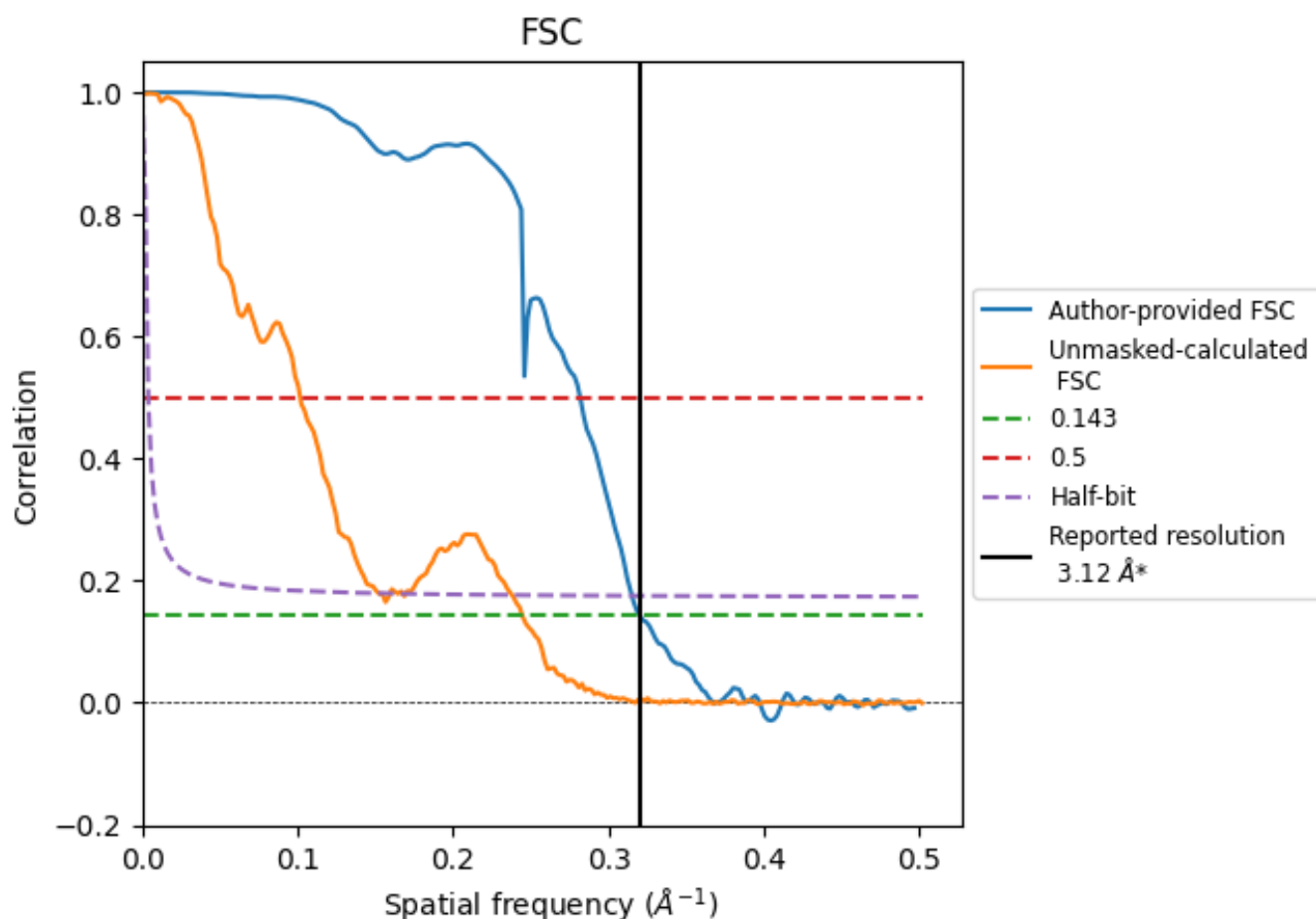


*Reported resolution corresponds to spatial frequency of 0.321 \AA^{-1}

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 0.321 Å⁻¹

8.2 Resolution estimates [i](#)

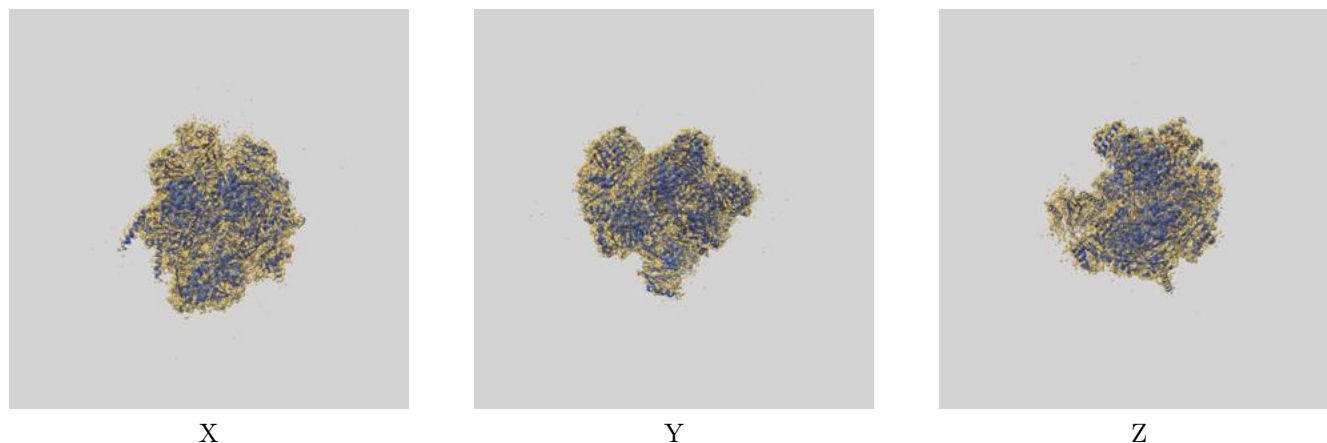
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.12	-	-
Author-provided FSC curve	3.12	3.55	3.17
Unmasked-calculated*	4.09	9.83	6.57

*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 4.09 differs from the reported value 3.12 by more than 10 %

9 Map-model fit [i](#)

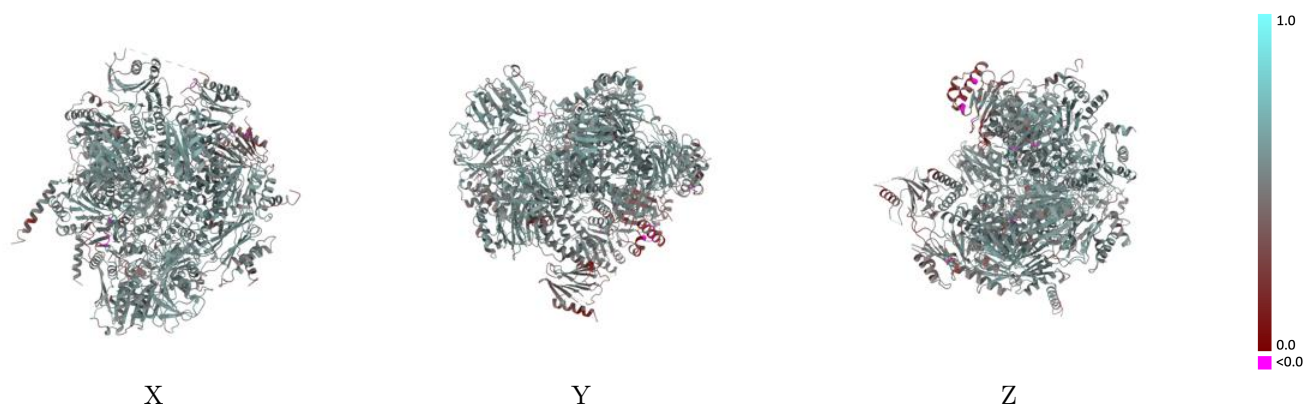
This section contains information regarding the fit between EMDB map EMD-54046 and PDB model 9RLZ. Per-residue inclusion information can be found in section [3](#) on page [7](#).

9.1 Map-model overlay [i](#)



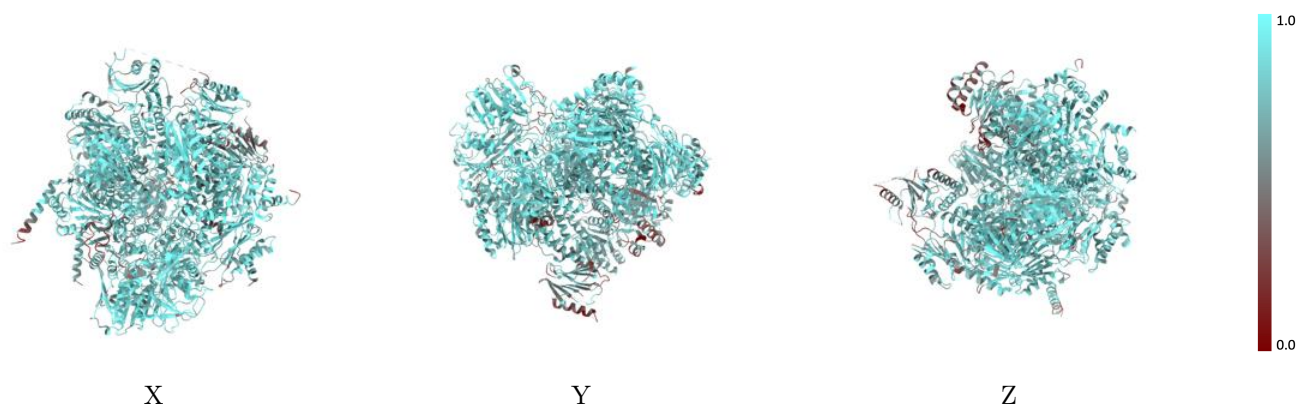
The images above show the 3D surface view of the map at the recommended contour level 0.128 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



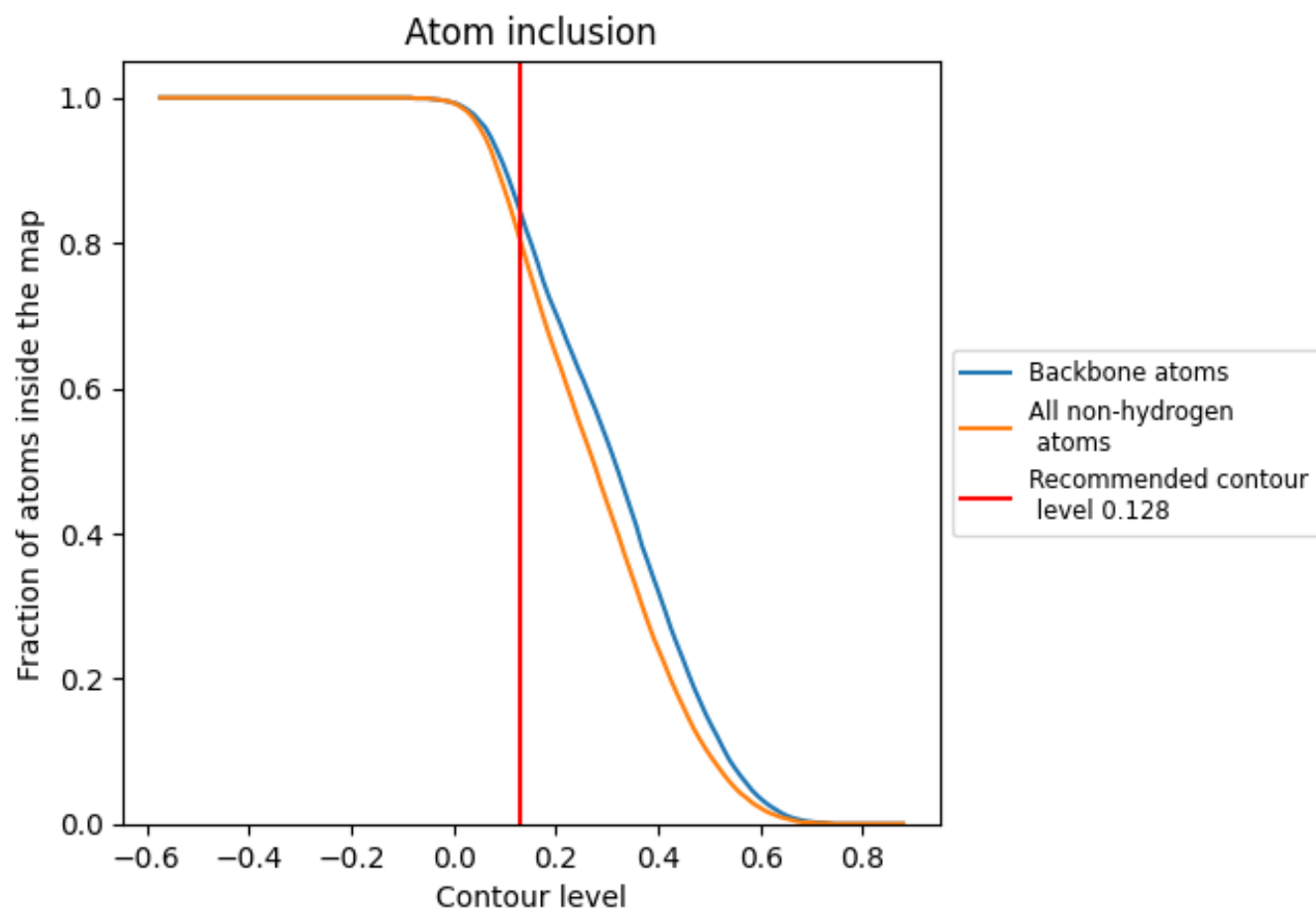
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.128).



































9.4 Atom inclusion [i](#)



At the recommended contour level, 85% of all backbone atoms, 81% 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 (0.128) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8090	 0.5270
3	 0.7570	 0.5280
4	 0.7940	 0.5150
5	 0.8370	 0.5300
A	 0.8700	 0.5560
B	 0.8800	 0.5650
C	 0.8490	 0.5510
D	 0.8300	 0.5430
E	 0.8270	 0.5430
F	 0.8540	 0.5530
G	 0.8380	 0.5430
H	 0.6060	 0.3960
I	 0.8270	 0.5300
J	 0.8290	 0.5380
K	 0.7870	 0.5170
L	 0.7660	 0.4980
M	 0.6450	 0.4490

