



Full wwPDB EM Validation Report ⓘ

Mar 9, 2026 – 04:40 AM UTC

PDB ID : 6QG3 / pdb_00006qg3
EMDB ID : EMD-4546
Title : Structure of eIF2B-eIF2 (phosphorylated at Ser51) complex (model B)
Authors : Llacer, J.L.; Gordiyenko, Y.; Ramakrishnan, V.
Deposited on : 2019-01-10
Resolution : 9.40 Å (reported)
Based on initial models : 6FYX, 5B04

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

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

A user guide is available at

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

The types of validation reports are described at

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

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

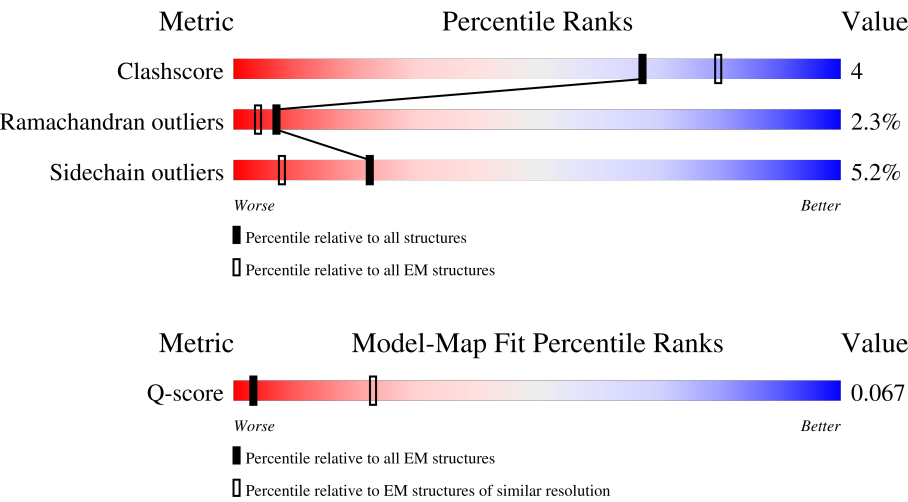
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDb archive up until May 2025)
MapQ : 1.9.13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

1 Overall quality at a glance i

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

The reported resolution of this entry is 9.40 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.



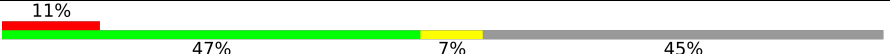
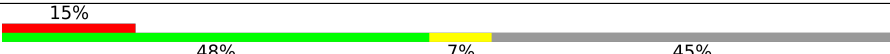
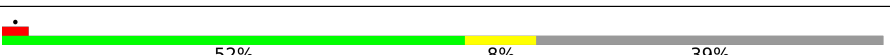
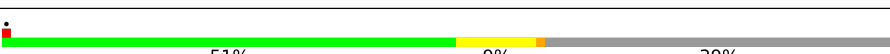
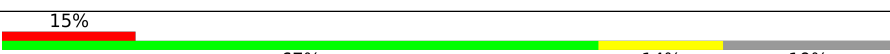
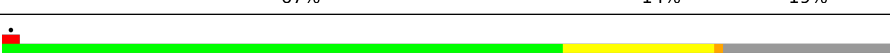
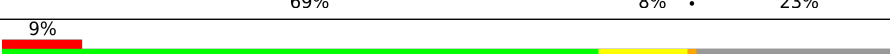
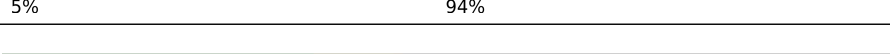
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	224 (8.90 - 9.90)

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	305	8% 77% 20% ..
1	B	305	6% 80% 17% ..
2	C	381	13% 79% 10% 9%
2	D	381	17% 80% 10% 9%

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Mol	Chain	Length	Quality of chain
3	E	578	
3	F	578	
4	G	651	
4	H	651	
5	I	712	
5	J	712	
6	K	304	
6	L	304	
7	M	527	
7	N	527	
8	O	285	
8	P	285	

2 Entry composition

There are 8 unique types of molecules in this entry. The entry contains 38678 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 Translation initiation factor eIF-2B subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	302	Total	C	N	O	S	0	0
			2351	1504	394	443	10		
1	B	302	Total	C	N	O	S	0	0
			2351	1504	394	443	10		

- Molecule 2 is a protein called Translation initiation factor eIF-2B subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	345	Total	C	N	O	S	0	0
			2665	1694	463	502	6		
2	D	345	Total	C	N	O	S	0	0
			2665	1694	463	502	6		

- Molecule 3 is a protein called Translation initiation factor eIF-2B subunit gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	267	Total	C	N	O	S	0	0
			2164	1391	363	400	10		
3	F	375	Total	C	N	O	S	0	0
			2967	1895	504	550	18		

- Molecule 4 is a protein called Translation initiation factor eIF-2B subunit delta.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	355	Total	C	N	O	S	0	0
			2744	1738	474	521	11		
4	H	355	Total	C	N	O	S	0	0
			2744	1738	474	521	11		

- Molecule 5 is a protein called Translation initiation factor eIF-2B subunit epsilon.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	I	431	Total	C	N	O	S	0	0
			3406	2147	573	666	20		
5	J	431	Total	C	N	O	S	0	0
			3406	2147	573	666	20		

- Molecule 6 is a protein called Eukaryotic translation initiation factor 2 subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	K	246	Total	C	N	O	P S	0	0
			1974	1259	324	382	1 8		
6	L	246	Total	C	N	O	P S	0	0
			1974	1259	324	382	1 8		

- Molecule 7 is a protein called Eukaryotic translation initiation factor 2 subunit gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	M	408	Total	C	N	O	S	0	0
			3044	1934	546	548	16		
7	N	408	Total	C	N	O	S	0	0
			3044	1934	546	548	16		

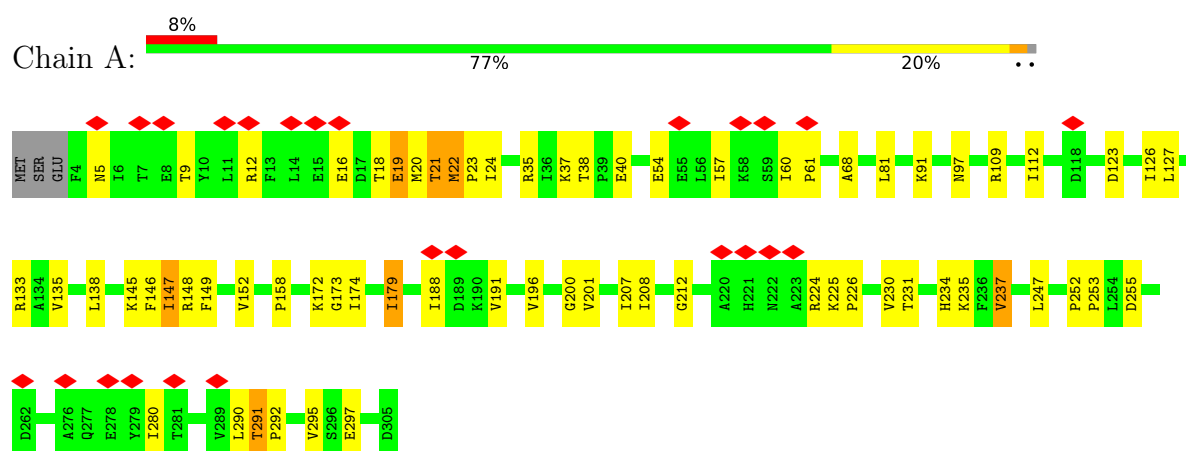
- Molecule 8 is a protein called Eukaryotic translation initiation factor 2 subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	O	17	Total	C	N	O		0	0
			143	96	24	23			
8	P	128	Total	C	N	O	S	0	0
			1036	661	186	182	7		

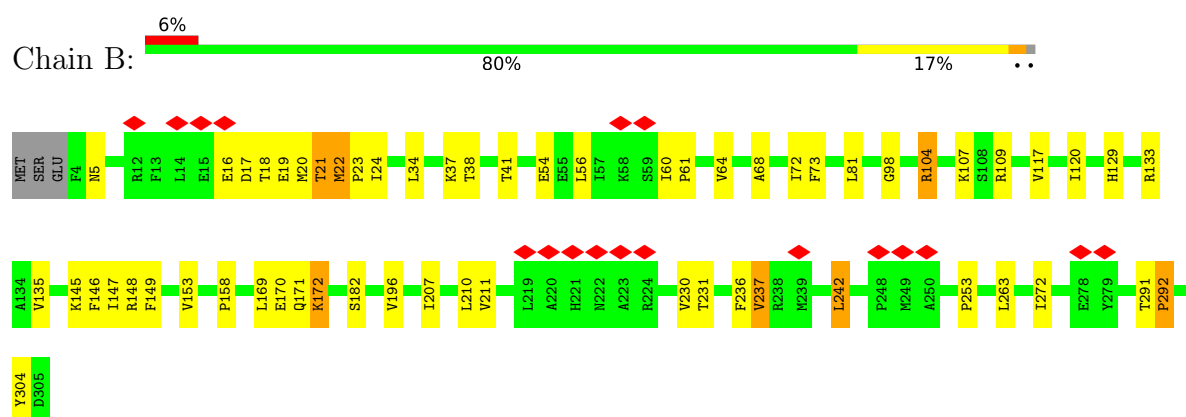
3 Residue-property plots

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.

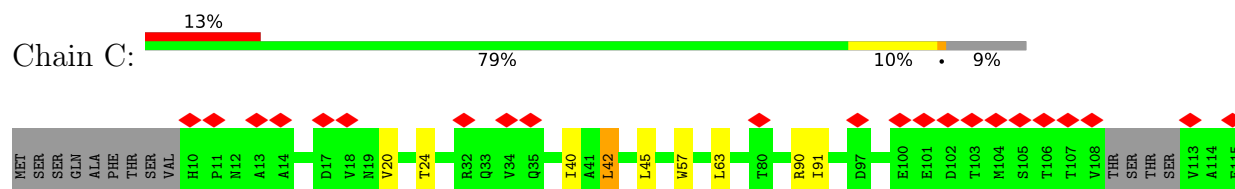
- Molecule 1: Translation initiation factor eIF-2B subunit alpha

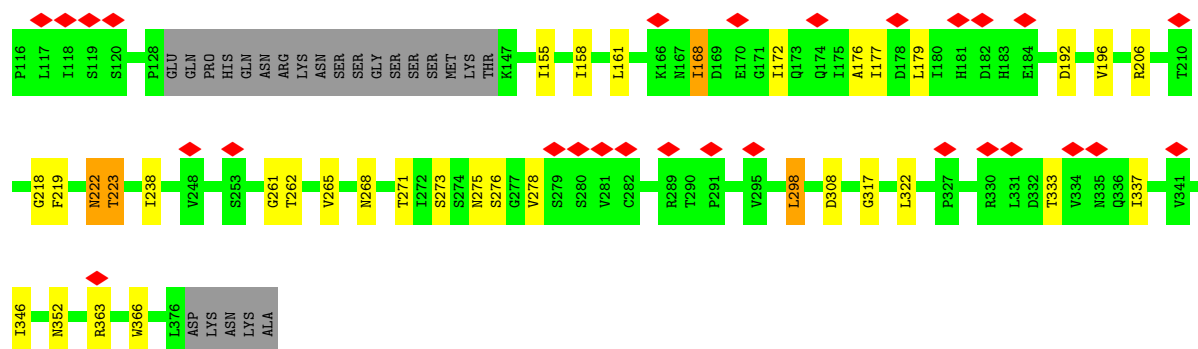


- Molecule 1: Translation initiation factor eIF-2B subunit alpha

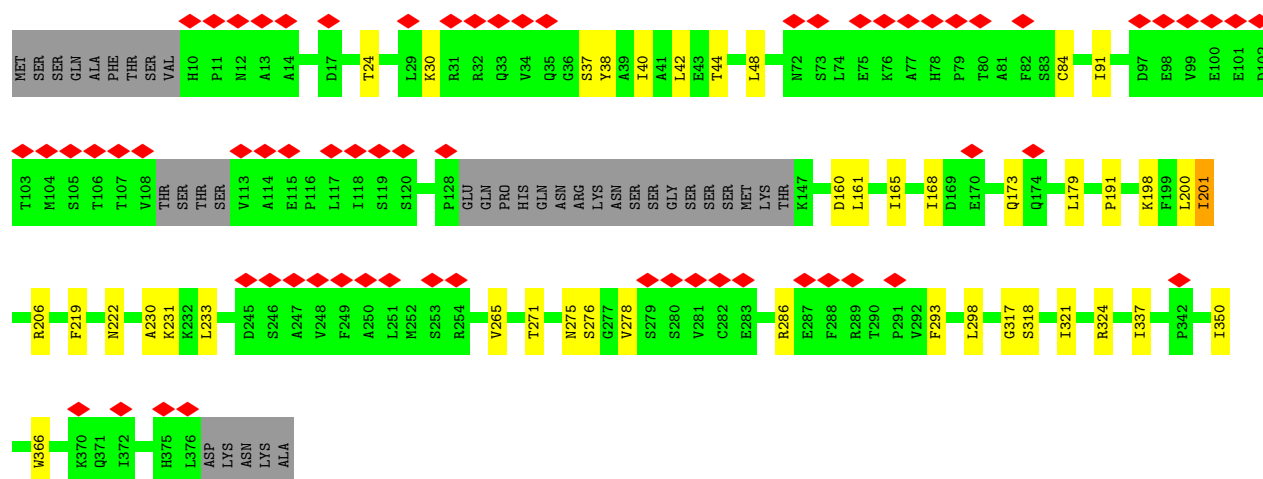
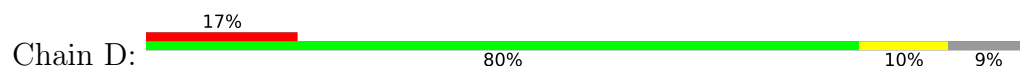


- Molecule 2: Translation initiation factor eIF-2B subunit beta

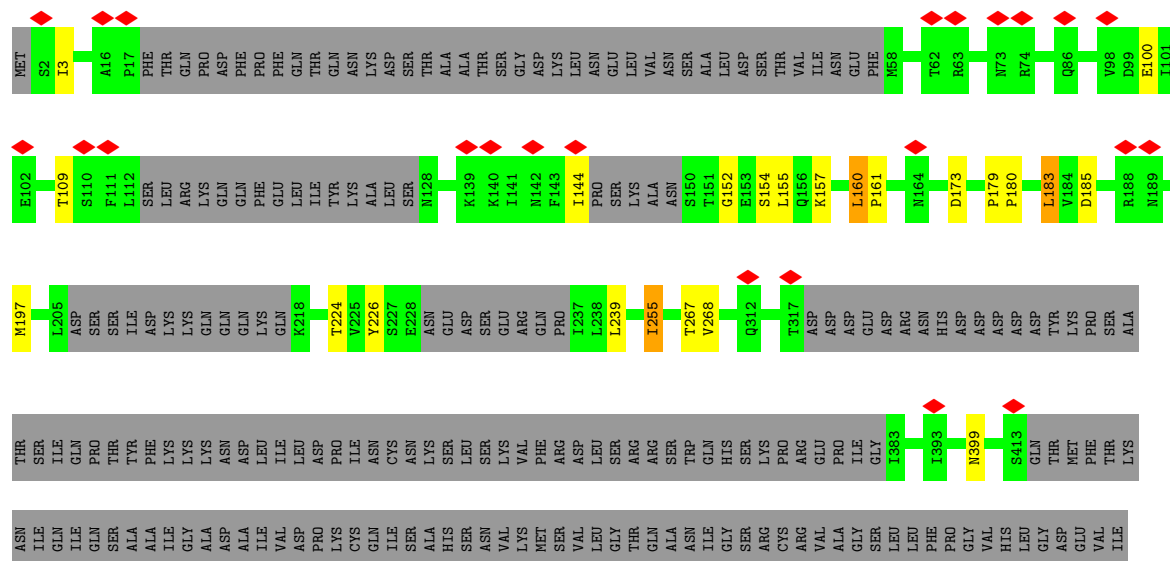




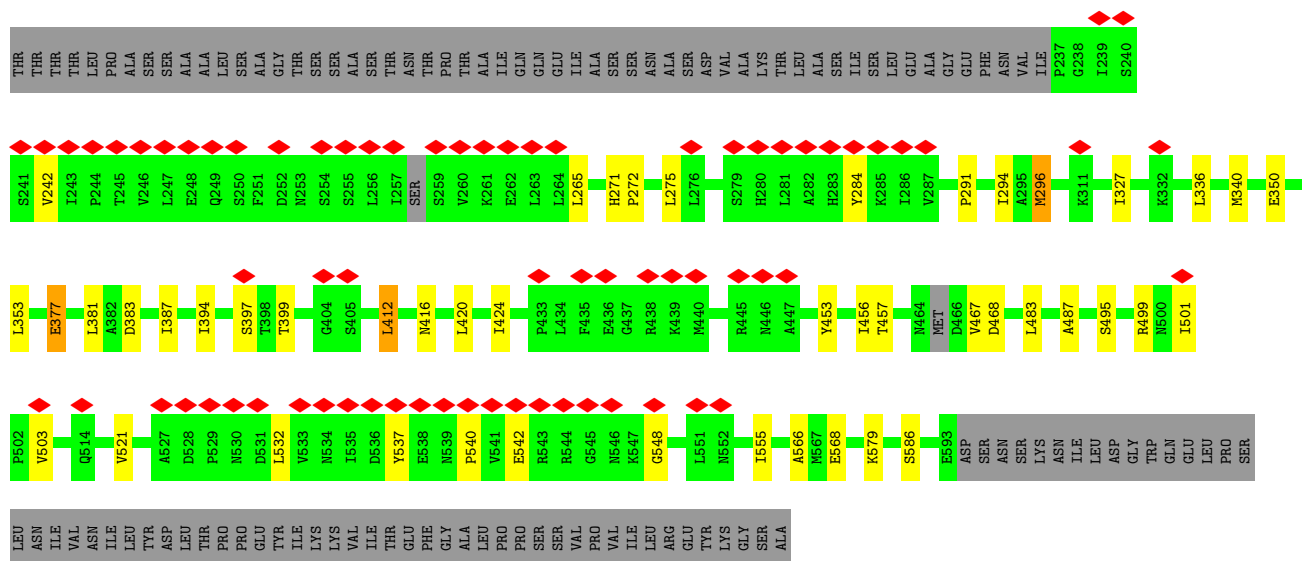
• Molecule 2: Translation initiation factor eIF-2B subunit beta



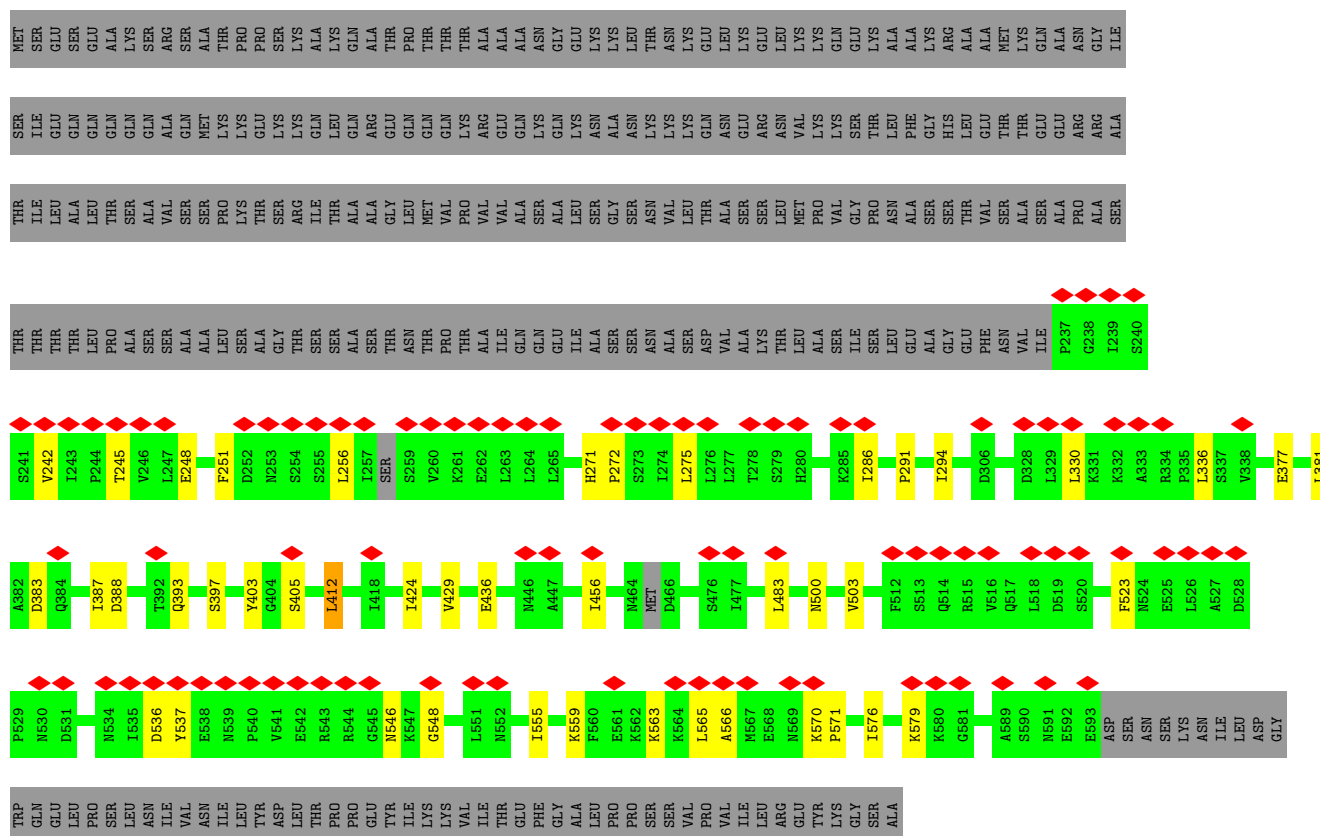
• Molecule 3: Translation initiation factor eIF-2B subunit gamma







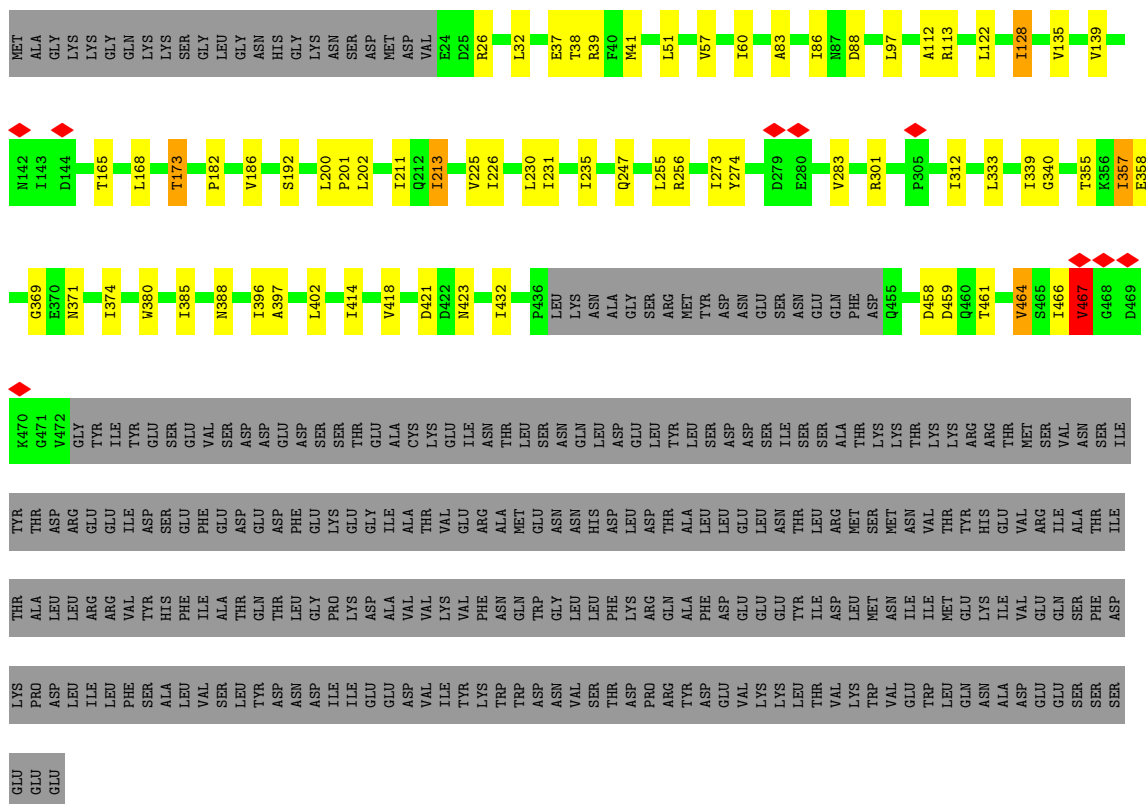
• Molecule 4: Translation initiation factor eIF-2B subunit delta



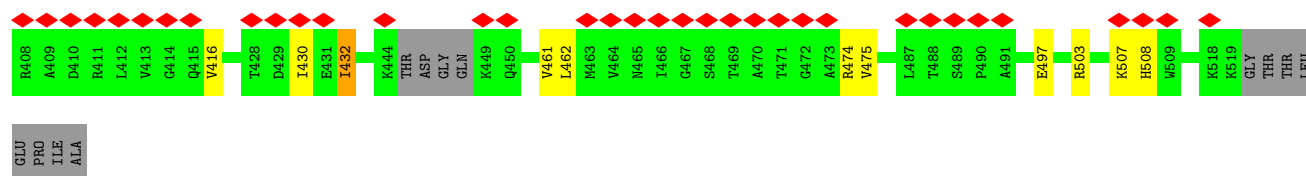
• Molecule 5: Translation initiation factor eIF-2B subunit epsilon



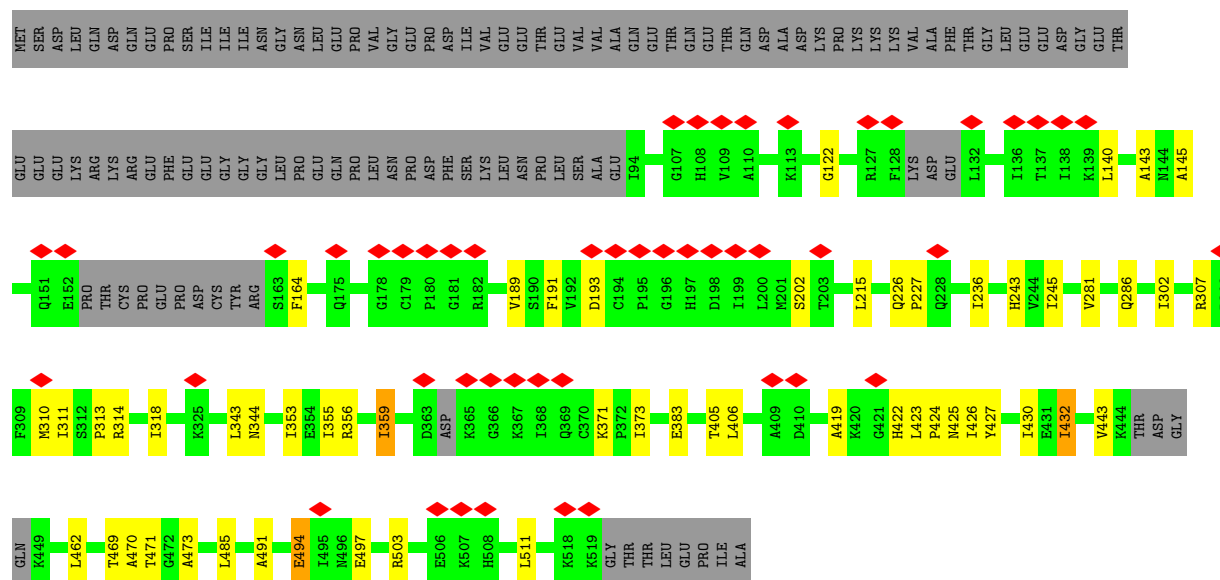
- Molecule 5: Translation initiation factor eIF-2B subunit epsilon



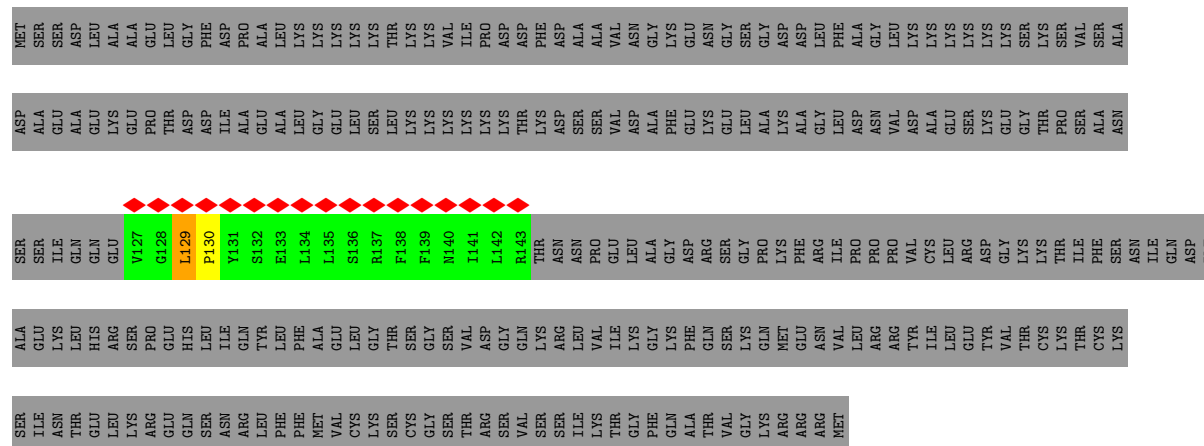
- Molecule 6: Eukaryotic translation initiation factor 2 subunit alpha



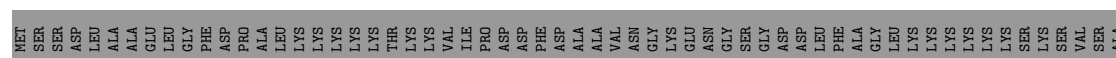
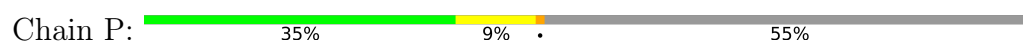
• Molecule 7: Eukaryotic translation initiation factor 2 subunit gamma



• Molecule 8: Eukaryotic translation initiation factor 2 subunit beta



• Molecule 8: Eukaryotic translation initiation factor 2 subunit beta





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	32759	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 ($e^-/\text{\AA}^2$)	45	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	104478	Depositor
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	0.115	Depositor
Minimum map value	-0.046	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	375.2, 375.2, 375.2	wwPDB
Map dimensions	280, 280, 280	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.34, 1.34, 1.34	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.55	0/2395	0.96	0/3251
1	B	0.55	0/2395	0.96	0/3251
2	C	0.58	0/2714	1.02	0/3693
2	D	0.56	0/2714	0.99	1/3693 (0.0%)
3	E	0.56	0/2209	0.90	1/2989 (0.0%)
3	F	0.57	0/3022	0.90	0/4084
4	G	0.56	0/2781	0.98	1/3747 (0.0%)
4	H	0.55	0/2781	0.98	0/3747
5	I	0.57	1/3468 (0.0%)	0.92	0/4704
5	J	0.58	0/3468	0.91	2/4704 (0.0%)
6	K	0.55	0/1989	0.96	2/2675 (0.1%)
6	L	0.54	0/1989	0.97	2/2675 (0.1%)
7	M	0.56	0/3087	0.90	2/4173 (0.0%)
7	N	0.55	0/3087	0.90	1/4173 (0.0%)
8	O	0.56	0/146	0.97	0/196
8	P	0.53	0/1051	0.88	0/1402
All	All	0.56	1/39296 (0.0%)	0.94	12/53157 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	I	242	VAL	CA-CB	5.05	1.56	1.54

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
7	M	300	LYS	N-CA-C	6.93	118.52	110.97
7	M	356	ARG	N-CA-C	6.36	120.87	112.35
6	K	254	VAL	N-CA-C	6.03	116.70	110.36
6	L	118	LYS	N-CA-C	5.84	117.52	111.03

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	G	377	GLU	N-CA-C	5.55	117.19	111.03
6	K	118	LYS	N-CA-C	5.50	117.13	111.03
5	J	57	VAL	CA-C-N	5.30	125.30	119.89
5	J	57	VAL	C-N-CA	5.30	125.30	119.89
3	E	109	THR	N-CA-C	5.14	116.74	111.03
2	D	173	GLN	N-CA-C	5.10	117.50	111.33
7	N	423	LEU	N-CA-C	5.09	119.72	108.27
6	L	30	MET	N-CA-C	-5.05	107.07	113.43

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2351	0	2367	38	0
1	B	2351	0	2367	43	0
2	C	2665	0	2626	15	0
2	D	2665	0	2626	12	0
3	E	2164	0	2154	10	0
3	F	2967	0	2975	13	0
4	G	2744	0	2819	17	0
4	H	2744	0	2819	15	0
5	I	3406	0	3359	20	0
5	J	3406	0	3359	25	0
6	K	1974	0	2020	12	0
6	L	1974	0	2020	26	0
7	M	3044	0	3126	22	0
7	N	3044	0	3126	27	0
8	O	143	0	148	1	0
8	P	1036	0	1080	14	0
All	All	38678	0	38991	291	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 4.

All (291) 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:A:21:THR:O	1:A:23:PRO:HD2	1.23	1.35
1:A:21:THR:O	1:A:23:PRO:CD	1.76	1.34
1:A:147:ILE:O	1:A:149:PHE:CD2	1.87	1.25
1:A:173:GLY:O	1:A:174:ILE:HG13	1.34	1.21
6:L:90:VAL:HG11	6:L:95:ILE:HG13	1.24	1.20
7:M:142:TYR:HB2	7:M:319:ARG:NH2	1.67	1.10
6:L:87:LYS:O	6:L:90:VAL:HG23	1.51	1.08
1:A:147:ILE:O	1:A:149:PHE:CE2	2.05	1.08
7:M:142:TYR:HB2	7:M:319:ARG:HH22	0.97	1.07
7:N:313:PRO:HG2	7:N:419:ALA:HB3	1.07	1.03
1:B:21:THR:HG21	1:B:24:ILE:CD1	1.90	1.02
7:M:142:TYR:CB	7:M:319:ARG:HH22	1.71	1.01
1:A:21:THR:O	1:A:23:PRO:N	1.93	1.01
7:N:313:PRO:HG2	7:N:419:ALA:CB	1.90	1.01
7:N:313:PRO:CG	7:N:419:ALA:HB3	1.93	0.99
6:L:87:LYS:O	6:L:90:VAL:CG2	2.19	0.90
1:A:173:GLY:C	1:A:174:ILE:HG13	1.96	0.89
1:B:21:THR:CG2	1:B:24:ILE:CD1	2.49	0.89
6:L:90:VAL:CG1	6:L:95:ILE:HG13	2.02	0.89
6:L:21:MET:HE2	6:L:70:VAL:HA	1.55	0.87
1:A:173:GLY:O	1:A:174:ILE:CG1	2.23	0.85
1:B:21:THR:HG21	1:B:24:ILE:HD13	1.58	0.85
1:B:21:THR:CG2	1:B:24:ILE:HD13	2.07	0.85
1:B:21:THR:CG2	1:B:23:PRO:HD2	2.09	0.82
6:L:90:VAL:HG11	6:L:95:ILE:CG1	2.10	0.81
7:N:143:ALA:HB3	7:N:191:PHE:HB2	1.63	0.81
1:B:147:ILE:O	1:B:149:PHE:HD1	1.64	0.81
1:B:21:THR:CG2	1:B:24:ILE:HD12	2.11	0.80
1:B:21:THR:HG21	1:B:24:ILE:HD12	1.65	0.78
1:B:21:THR:HG22	1:B:23:PRO:HD2	1.66	0.77
1:A:21:THR:C	1:A:23:PRO:HD2	2.09	0.76
1:A:21:THR:C	1:A:23:PRO:CD	2.60	0.75
1:A:112:ILE:HG22	1:A:138:LEU:HD21	1.70	0.73
3:E:160:LEU:H	3:E:161:PRO:HD2	1.54	0.70
7:M:142:TYR:HB2	7:M:319:ARG:CZ	2.20	0.70
1:B:17:ASP:C	1:B:19:GLU:H	2.00	0.69
1:B:17:ASP:O	1:B:19:GLU:N	2.26	0.69
7:N:356:ARG:NE	7:N:424:PRO:HD2	2.09	0.68
3:F:160:LEU:H	3:F:161:PRO:HD2	1.57	0.68
1:B:21:THR:CB	1:B:24:ILE:HD13	2.23	0.67
5:J:414:ILE:HG12	5:J:432:ILE:HD12	1.77	0.67

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:H:387:ILE:HD13	4:H:412:LEU:HD22	1.76	0.66
1:A:147:ILE:H	1:A:149:PHE:HE2	1.43	0.65
4:H:383:ASP:O	4:H:387:ILE:HG12	1.97	0.64
1:B:17:ASP:O	1:B:18:THR:OG1	2.13	0.64
8:P:257:MET:H	8:P:268:VAL:CG2	2.11	0.63
6:L:146:LYS:O	6:L:149:ILE:HG13	1.98	0.63
2:C:333:THR:HG22	4:G:453:TYR:HB3	1.81	0.63
7:N:307:ARG:HD3	7:N:344:ASN:HA	1.80	0.62
1:B:169:LEU:O	1:B:172:LYS:HB2	2.00	0.62
6:L:91:SER:O	6:L:94:ASP:HB2	2.00	0.62
1:B:21:THR:HB	1:B:24:ILE:HD13	1.82	0.61
1:B:21:THR:HG23	1:B:23:PRO:HD2	1.81	0.61
1:B:21:THR:HG22	1:B:21:THR:O	2.00	0.61
7:M:142:TYR:HB2	7:M:319:ARG:NH1	2.15	0.61
6:K:149:ILE:HG21	6:K:173:ILE:HG21	1.84	0.60
7:N:425:ASN:HB3	7:N:427:TYR:CE2	2.36	0.60
5:J:464:VAL:HB	5:J:467:VAL:HG23	1.84	0.59
1:B:170:GLU:C	1:B:172:LYS:H	2.10	0.59
5:I:459:ASP:H	5:I:466:ILE:HD12	1.68	0.59
7:M:142:TYR:HB2	7:M:319:ARG:HH12	1.67	0.59
6:K:146:LYS:O	6:K:149:ILE:HG13	2.03	0.58
7:N:145:ALA:HB3	7:N:189:VAL:HG23	1.85	0.58
8:P:268:VAL:O	8:P:268:VAL:HG12	2.02	0.58
1:A:208:ILE:HD12	1:A:247:LEU:HD21	1.85	0.58
1:B:145:LYS:O	1:B:146:PHE:HB2	2.03	0.57
2:C:196:VAL:HG21	2:C:261:GLY:HA2	1.86	0.57
1:B:109:ARG:HH22	1:B:133:ARG:HB3	1.69	0.57
1:B:135:VAL:HG22	1:B:230:VAL:HB	1.87	0.56
1:A:21:THR:O	1:A:22:MET:C	2.48	0.56
1:B:120:ILE:CG2	1:B:147:ILE:HG21	2.34	0.56
4:G:468:ASP:HA	4:G:501:ILE:HD13	1.87	0.56
1:B:21:THR:HG22	1:B:24:ILE:HD12	1.86	0.56
2:D:317:GLY:HA2	5:J:301:ARG:HB3	1.88	0.56
7:N:313:PRO:CG	7:N:419:ALA:CB	2.68	0.56
6:L:89:ARG:O	6:L:90:VAL:C	2.49	0.55
6:K:92:SER:HA	6:K:95:ILE:HD12	1.88	0.55
4:G:394:ILE:HD13	4:G:416:ASN:HD21	1.70	0.55
6:L:104:LYS:O	6:L:108:VAL:HG23	2.06	0.55
5:I:351:ILE:HG12	5:I:368:ILE:HD12	1.88	0.54
1:A:291:THR:H	1:A:292:PRO:HD3	1.73	0.54
7:N:462:LEU:HD22	7:N:503:ARG:HG2	1.88	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
8:P:257:MET:H	8:P:268:VAL:HG21	1.72	0.54
6:L:112:LEU:HD22	6:L:126:LEU:HB3	1.89	0.54
2:D:231:LYS:HD2	4:H:546:ASN:HD21	1.73	0.54
5:J:165:THR:HA	5:J:274:TYR:HB2	1.90	0.53
8:P:189:GLU:HA	8:P:192:ILE:HD12	1.90	0.53
2:D:318:SER:HA	2:D:321:ILE:HD12	1.91	0.53
1:A:21:THR:HG21	1:A:234:HIS:CE1	2.44	0.53
4:G:483:LEU:HB3	4:G:566:ALA:HB3	1.91	0.52
1:A:57:ILE:HA	1:A:60:ILE:HD12	1.92	0.52
7:M:237:GLU:HB3	7:M:274:ILE:HD12	1.91	0.52
7:N:471:THR:HG21	7:N:491:ALA:HB2	1.90	0.52
6:L:71:ALA:HB1	6:L:85:LEU:HD23	1.92	0.51
6:L:193:PHE:HB3	7:N:359:ILE:HG12	1.92	0.51
7:N:356:ARG:HE	7:N:424:PRO:HD2	1.75	0.51
1:A:18:THR:O	1:A:19:GLU:HB2	2.11	0.51
1:B:120:ILE:CG2	1:B:147:ILE:CG2	2.89	0.51
4:H:330:LEU:HB3	4:H:336:LEU:HD21	1.93	0.50
8:P:169:GLY:HA3	8:P:216:LYS:HG3	1.92	0.50
4:H:377:GLU:HA	4:H:381:LEU:HD12	1.93	0.50
1:A:68:ALA:HB2	1:A:237:VAL:HG22	1.94	0.50
1:B:17:ASP:C	1:B:19:GLU:N	2.65	0.50
1:B:129:HIS:HB3	1:B:196:VAL:HG22	1.92	0.50
1:A:147:ILE:C	1:A:149:PHE:CD2	2.82	0.49
3:E:226:TYR:HB3	3:E:239:LEU:H	1.76	0.49
3:F:190:ARG:HH22	3:F:238:LEU:HD12	1.77	0.49
5:I:414:ILE:HG12	5:I:432:ILE:HD12	1.93	0.49
2:C:90:ARG:HH22	2:C:298:LEU:HD13	1.76	0.49
5:J:414:ILE:HA	5:J:432:ILE:HB	1.93	0.49
5:I:178:ARG:HH22	5:I:229:ASP:HA	1.77	0.49
5:J:396:ILE:HG13	5:J:414:ILE:HD12	1.93	0.49
1:A:152:VAL:HG13	1:A:179:ILE:HD13	1.93	0.49
2:C:168:ILE:HG23	2:C:352:ASN:HD22	1.77	0.49
5:J:340:GLY:HA3	5:J:358:GLU:HG3	1.95	0.49
4:H:291:PRO:HA	4:H:294:ILE:HD12	1.94	0.49
3:F:485:ILE:HG23	3:F:489:ALA:HB3	1.94	0.48
1:B:21:THR:O	1:B:24:ILE:N	2.46	0.48
5:I:168:LEU:HB3	5:I:230:LEU:HD22	1.96	0.48
1:A:147:ILE:HG12	1:A:149:PHE:CE2	2.48	0.48
7:N:202:SER:HB2	7:N:470:ALA:HB1	1.95	0.48
1:B:21:THR:O	1:B:22:MET:C	2.57	0.48
1:B:292:PRO:HG3	2:C:268:ASN:HA	1.96	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:L:226:PRO:HA	7:N:405:THR:HG22	1.94	0.48
7:N:430:ILE:HD12	7:N:432:ILE:HD12	1.96	0.48
4:G:291:PRO:HA	4:G:294:ILE:HD12	1.95	0.48
5:I:165:THR:HA	5:I:274:TYR:HB2	1.95	0.48
1:A:127:LEU:HB2	1:A:191:VAL:HG11	1.95	0.47
1:B:117:VAL:HG21	1:B:145:LYS:HE3	1.96	0.47
3:F:101:ILE:HG23	3:F:102:GLU:HG3	1.96	0.47
1:A:135:VAL:HG22	1:A:230:VAL:HB	1.95	0.47
1:B:242:LEU:HB3	4:H:393:GLN:HG2	1.96	0.47
3:E:267:THR:HG23	5:J:225:VAL:HA	1.95	0.47
5:J:357:ILE:HA	5:J:374:ILE:HB	1.96	0.47
1:A:224:ARG:HH22	2:D:286:ARG:HE	1.62	0.47
1:A:21:THR:HG22	1:A:23:PRO:HD2	1.96	0.47
5:J:458:ASP:HB3	5:J:466:ILE:HD11	1.96	0.47
5:I:32:LEU:HB2	5:I:136:SER:HA	1.96	0.47
6:K:133:PRO:HG2	6:K:134:LEU:HD12	1.97	0.47
7:M:142:TYR:CB	7:M:319:ARG:HH12	2.27	0.47
2:C:192:ASP:HB2	2:C:222:ASN:HD21	1.80	0.47
6:L:147:LEU:O	6:L:150:ILE:HG13	2.14	0.47
6:L:108:VAL:HG21	6:L:141:ALA:HB3	1.97	0.47
5:I:163:ILE:HD11	5:I:271:LYS:HB3	1.97	0.46
3:F:171:PRO:HD2	3:F:174:PHE:HE1	1.80	0.46
5:I:304:TYR:HB3	5:I:305:PRO:HD3	1.97	0.46
3:F:423:ILE:HD13	3:F:423:ILE:N	2.31	0.46
4:H:272:PRO:HA	4:H:275:LEU:HD12	1.98	0.46
5:I:296:GLN:HA	5:I:299:LEU:HD12	1.97	0.46
7:N:140:LEU:HA	7:N:193:ASP:O	2.16	0.46
5:J:385:ILE:HG12	5:J:402:LEU:HD12	1.96	0.46
6:K:20:VAL:HG12	6:K:38:GLU:HB3	1.97	0.46
6:L:111:ILE:HG23	6:L:169:LEU:HD21	1.97	0.46
8:P:257:MET:N	8:P:268:VAL:HG21	2.31	0.46
4:H:403:TYR:HD1	4:H:429:VAL:HB	1.80	0.46
6:L:70:VAL:HG21	6:L:95:ILE:HG23	1.97	0.46
8:O:129:LEU:H	8:O:130:PRO:HD2	1.80	0.46
4:H:483:LEU:HB3	4:H:566:ALA:HB3	1.98	0.45
6:L:90:VAL:CB	6:L:95:ILE:HG13	2.47	0.45
5:I:208:LYS:HE2	8:P:173:ILE:HG21	1.97	0.45
7:N:243:HIS:HB3	7:N:302:ILE:HG12	1.97	0.45
1:B:17:ASP:C	1:B:18:THR:OG1	2.59	0.45
4:G:399:THR:HB	4:G:467:VAL:HA	1.98	0.45
7:N:356:ARG:HG3	7:N:424:PRO:HG2	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:42:LEU:HA	2:C:45:LEU:HD12	1.98	0.45
7:N:313:PRO:HB2	7:N:419:ALA:H	1.81	0.45
3:E:179:PRO:HA	3:E:180:PRO:HD3	1.78	0.45
3:F:152:GLY:HA2	3:F:155:LEU:HD12	1.99	0.45
5:J:200:LEU:HD11	5:J:211:ILE:HD11	1.98	0.45
7:M:313:PRO:HA	7:M:345:GLY:HA3	1.98	0.45
4:G:377:GLU:HA	4:G:381:LEU:HD12	1.99	0.44
8:P:255:PHE:O	8:P:268:VAL:HB	2.17	0.44
4:G:495:SER:HB2	4:G:499:ARG:HH21	1.82	0.44
5:J:139:VAL:HG11	5:J:235:ILE:HD11	1.99	0.44
6:L:93:GLU:O	6:L:93:GLU:HG2	2.14	0.44
1:B:72:ILE:HD11	1:B:236:PHE:HB2	1.99	0.44
2:C:262:THR:HA	2:C:273:SER:HA	1.98	0.44
5:I:170:LYS:HG3	5:I:227:ARG:HH22	1.81	0.44
5:J:83:ALA:HA	5:J:86:ILE:HD12	1.98	0.44
8:P:232:GLU:OE2	8:P:270:SER:O	2.35	0.44
1:A:40:GLU:HG3	1:A:91:LYS:HE3	2.00	0.44
1:A:145:LYS:O	1:A:146:PHE:HB2	2.17	0.44
7:M:216:LEU:HD23	7:M:246:ILE:HG12	2.00	0.44
8:P:162:PRO:HA	8:P:163:PRO:HD3	1.91	0.44
1:A:123:ASP:HB2	1:A:148:ARG:HD2	1.99	0.44
2:D:30:LYS:HD3	5:J:312:ILE:HA	1.98	0.44
2:D:230:ALA:HA	2:D:233:LEU:HD12	2.00	0.44
5:I:339:ILE:HG22	5:I:357:ILE:HB	2.00	0.44
3:F:406:ARG:HA	3:F:409:LEU:HD12	2.00	0.44
6:K:220:VAL:HG13	6:K:230:LEU:HB3	2.00	0.44
7:M:243:HIS:HB3	7:M:302:ILE:HG12	1.99	0.44
2:C:218:GLY:HA2	4:G:457:THR:HG21	1.98	0.44
4:G:350:GLU:HA	4:G:353:LEU:HD12	1.99	0.44
6:L:21:MET:HG3	6:L:69:ASP:O	2.18	0.44
4:H:381:LEU:HD22	6:K:64:ARG:HD3	2.00	0.43
6:K:77:ASP:HB3	6:K:82:TYR:HB2	1.98	0.43
1:A:225:LYS:HA	1:A:226:PRO:HD3	1.88	0.43
4:G:296:MET:HG3	4:G:340:MET:HE3	2.01	0.43
2:D:37:SER:HA	2:D:40:ILE:HD12	2.00	0.43
5:J:37:GLU:C	5:J:39:ARG:H	2.26	0.43
7:N:313:PRO:CB	7:N:419:ALA:CB	2.96	0.43
4:G:387:ILE:HD13	4:G:412:LEU:HD22	2.00	0.43
6:L:91:SER:HB3	6:L:94:ASP:HB2	1.99	0.43
3:E:152:GLY:HA2	3:E:155:LEU:HD12	2.00	0.43
3:F:253:LEU:HD11	5:I:218:LEU:HD21	2.01	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:H:405:SER:HB3	4:H:436:GLU:HB3	2.01	0.43
2:C:155:ILE:HA	2:C:158:ILE:HD12	2.00	0.43
3:E:173:ASP:HB2	3:E:399:ASN:HD21	1.83	0.43
5:J:231:ILE:HG21	5:J:283:VAL:HG22	2.00	0.43
6:L:111:ILE:HG23	6:L:169:LEU:HD11	2.00	0.43
4:G:272:PRO:HA	4:G:275:LEU:HD12	1.99	0.43
5:J:168:LEU:HD22	5:J:230:LEU:HD13	2.01	0.43
6:K:207:SER:HB2	6:K:250:LYS:HD2	2.00	0.43
7:N:355:ILE:HB	7:N:373:ILE:HB	2.00	0.43
3:E:154:SER:HA	3:E:157:LYS:HE3	1.99	0.43
7:M:337:VAL:HA	7:M:399:GLY:HA2	2.00	0.43
1:A:200:GLY:HA2	1:A:235:LYS:HB3	2.01	0.43
2:C:265:VAL:HA	2:C:271:THR:HG22	1.99	0.43
7:N:313:PRO:CB	7:N:419:ALA:HB3	2.47	0.43
3:F:386:LEU:HA	3:F:387:PRO:HD3	1.94	0.42
4:G:416:ASN:HA	4:G:420:LEU:HD12	2.01	0.42
4:H:256:LEU:HD22	4:H:559:LYS:HZ2	1.84	0.42
7:M:462:LEU:HD22	7:M:503:ARG:HG2	2.00	0.42
7:N:226:GLN:HA	7:N:227:PRO:HD3	1.84	0.42
1:A:212:GLY:HA3	1:B:182:SER:HB2	2.01	0.42
1:A:252:PRO:HA	1:A:253:PRO:HD3	1.93	0.42
2:C:219:PHE:HA	2:C:223:THR:HG23	2.01	0.42
4:G:327:ILE:HG23	4:G:336:LEU:HD11	2.00	0.42
1:B:210:LEU:HB3	1:B:211:VAL:H	1.63	0.42
3:E:183:LEU:HB3	3:E:197:MET:HE3	2.02	0.42
3:E:255:ILE:HD11	5:J:213:ILE:HD11	2.02	0.42
5:J:135:VAL:HG22	5:J:235:ILE:HG23	2.02	0.42
6:K:71:ALA:HB3	6:K:85:LEU:HD23	2.02	0.42
7:N:473:ALA:HB1	7:N:485:LEU:HB3	2.01	0.42
2:D:179:LEU:HD13	2:D:293:PHE:HE2	1.84	0.42
5:I:344:ALA:HB3	5:I:361:VAL:HG13	2.02	0.42
5:J:255:LEU:HD12	5:J:256:ARG:HG2	2.01	0.42
6:L:149:ILE:HG21	6:L:173:ILE:HD13	2.02	0.42
2:D:265:VAL:HA	2:D:271:THR:HG22	2.01	0.42
5:I:212:GLN:HG3	8:P:167:ARG:HB3	2.01	0.42
7:M:149:LYS:HE3	7:M:299:VAL:HG21	2.00	0.42
1:B:41:THR:HG22	6:K:75:ARG:HB3	2.00	0.42
1:B:172:LYS:CE	1:B:172:LYS:HA	2.49	0.42
3:F:478:VAL:HG11	3:F:491:ILE:HD12	2.01	0.42
2:D:48:LEU:HD13	2:D:91:ILE:HD13	2.02	0.42
4:G:271:HIS:HA	4:G:272:PRO:HD3	1.90	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:I:37:GLU:C	5:I:39:ARG:H	2.28	0.42
5:J:380:TRP:HE3	5:J:397:ALA:HA	1.84	0.42
1:B:68:ALA:HB2	1:B:237:VAL:HG22	2.02	0.42
5:I:368:ILE:HG12	5:I:385:ILE:HD12	2.02	0.42
7:M:312:SER:HA	7:M:313:PRO:HD3	1.94	0.42
7:N:422:HIS:NE2	7:N:424:PRO:HG3	2.35	0.42
6:L:51:LEU:HA	6:L:87:LYS:HB3	2.02	0.42
6:L:92:SER:HB3	6:L:93:GLU:H	1.61	0.42
1:B:104:ARG:HA	1:B:107:LYS:HE3	2.02	0.41
3:E:224:THR:HG22	3:E:268:VAL:HG22	2.02	0.41
4:H:570:LYS:HB2	4:H:571:PRO:HD3	2.02	0.41
1:B:34:LEU:HD22	1:B:73:PHE:HZ	1.83	0.41
2:C:172:ILE:HG22	2:C:176:ALA:HB2	2.02	0.41
7:N:215:LEU:HD23	7:N:245:ILE:HB	2.01	0.41
8:P:159:ARG:HH12	8:P:183:LYS:HB3	1.85	0.41
1:A:147:ILE:HG12	1:A:149:PHE:HE2	1.83	0.41
1:B:170:GLU:C	1:B:172:LYS:N	2.75	0.41
7:M:215:LEU:HD23	7:M:245:ILE:HB	2.03	0.41
8:P:187:SER:HA	8:P:188:PRO:HD3	1.95	0.41
8:P:211:LEU:HD13	8:P:213:ILE:HD11	2.02	0.41
7:M:461:VAL:HG22	7:M:474:ARG:HE	1.86	0.41
1:A:9:THR:O	1:A:12:ARG:HB2	2.20	0.41
1:A:109:ARG:HH22	1:A:133:ARG:HB3	1.85	0.41
1:B:120:ILE:HG21	1:B:147:ILE:CG2	2.51	0.41
1:A:201:VAL:HG11	1:A:295:VAL:HG21	2.02	0.41
5:J:418:VAL:HG22	5:J:461:THR:HG22	2.03	0.41
3:F:198:THR:HB	3:F:272:LEU:HB3	2.03	0.41
5:J:128:ILE:H	5:J:128:ILE:HG13	1.74	0.41
7:M:141:GLY:O	7:M:319:ARG:NH2	2.54	0.41
7:M:430:ILE:HD12	7:M:432:ILE:HD12	2.03	0.41
2:D:219:PHE:HE2	2:D:321:ILE:HG12	1.85	0.41
4:G:383:ASP:O	4:G:387:ILE:HG12	2.19	0.41
4:H:271:HIS:HA	4:H:272:PRO:HD3	1.86	0.41
2:C:57:TRP:HB3	2:C:63:LEU:HD13	2.03	0.40
6:K:247:ALA:HA	6:K:250:LYS:HE3	2.03	0.40
1:A:291:THR:H	1:A:292:PRO:CD	2.34	0.40
2:D:198:LYS:O	2:D:201:ILE:HG22	2.20	0.40
7:M:98:GLN:HE22	7:M:396:ILE:HD11	1.86	0.40
5:I:67:LEU:HB3	5:I:72:VAL:HG21	2.03	0.40
5:J:186:VAL:HG22	5:J:226:ILE:HG12	2.03	0.40
7:M:356:ARG:HB2	7:M:416:VAL:HG23	2.03	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:17:ASP:C	1:B:18:THR:HG1	2.20	0.40
2:C:317:GLY:HA2	5:I:301:ARG:HB3	2.03	0.40
3:F:183:LEU:HD22	3:F:197:MET:HE3	2.02	0.40
7:M:375:SER:HB3	7:M:402:VAL:HG23	2.03	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	300/305 (98%)	249 (83%)	41 (14%)	10 (3%)	3	21
1	B	300/305 (98%)	253 (84%)	34 (11%)	13 (4%)	2	17
2	C	339/381 (89%)	308 (91%)	28 (8%)	3 (1%)	14	51
2	D	339/381 (89%)	309 (91%)	25 (7%)	5 (2%)	8	40
3	E	253/578 (44%)	218 (86%)	33 (13%)	2 (1%)	16	54
3	F	357/578 (62%)	294 (82%)	50 (14%)	13 (4%)	2	20
4	G	349/651 (54%)	303 (87%)	35 (10%)	11 (3%)	3	21
4	H	349/651 (54%)	301 (86%)	37 (11%)	11 (3%)	3	21
5	I	427/712 (60%)	380 (89%)	39 (9%)	8 (2%)	6	32
5	J	427/712 (60%)	366 (86%)	44 (10%)	17 (4%)	2	18
6	K	237/304 (78%)	209 (88%)	26 (11%)	2 (1%)	16	54
6	L	237/304 (78%)	206 (87%)	28 (12%)	3 (1%)	9	42
7	M	398/527 (76%)	345 (87%)	48 (12%)	5 (1%)	9	42
7	N	398/527 (76%)	349 (88%)	43 (11%)	6 (2%)	8	40
8	O	15/285 (5%)	13 (87%)	1 (7%)	1 (7%)	1	12
8	P	120/285 (42%)	107 (89%)	11 (9%)	2 (2%)	7	36

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
All	All	4845/7486 (65%)	4210 (87%)	523 (11%)	112 (2%)	7	28

All (112) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	19	GLU
1	A	22	MET
1	B	61	PRO
3	E	100	GLU
3	F	100	GLU
4	G	487	ALA
4	H	536	ASP
5	J	202	LEU
1	B	158	PRO
1	B	304	TYR
2	C	275	ASN
2	C	276	SER
2	C	337	ILE
2	D	275	ASN
2	D	276	SER
2	D	337	ILE
3	F	460	ARG
4	G	579	LYS
4	H	537	TYR
5	I	173	THR
5	I	464	VAL
5	J	201	PRO
5	J	355	THR
5	J	459	ASP
5	J	464	VAL
7	M	507	LYS
7	N	497	GLU
1	A	16	GLU
1	A	97	ASN
1	A	158	PRO
1	A	291	THR
1	B	16	GLU
1	B	38	THR
1	B	98	GLY
1	B	171	GLN
1	B	291	THR
3	E	160	LEU

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Mol	Chain	Res	Type
3	F	459	SER
4	G	265	LEU
4	G	397	SER
4	G	537	TYR
4	G	586	SER
4	H	397	SER
4	H	579	LYS
5	I	112	ALA
5	I	423	ASN
5	I	459	ASP
5	J	112	ALA
5	J	173	THR
5	J	182	PRO
5	J	371	ASN
5	J	388	ASN
5	J	423	ASN
6	K	225	ALA
6	L	132	TRP
7	M	127	ARG
7	M	164	PHE
7	M	383	GLU
7	N	122	GLY
7	N	164	PHE
7	N	383	GLU
1	A	5	ASN
1	A	61	PRO
1	B	5	ASN
1	B	263	LEU
3	F	160	LEU
3	F	311	GLN
3	F	443	HIS
3	F	488	MET
3	F	494	LYS
4	H	251	PHE
5	I	311	ASN
5	J	26	ARG
5	J	192	SER
5	J	421	ASP
6	K	81	GLY
8	O	129	LEU
7	N	469	THR
8	P	200	GLY

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Mol	Chain	Res	Type
1	A	38	THR
1	B	22	MET
2	D	324	ARG
3	F	180	PRO
3	F	238	LEU
3	F	476	ASP
3	F	515	LYS
4	G	242	VAL
4	G	542	GLU
4	G	548	GLY
4	H	248	GLU
4	H	500	ASN
4	H	548	GLY
4	H	555	ILE
5	J	369	GLY
6	L	90	VAL
7	M	497	GLU
7	N	494	GLU
8	P	129	LEU
1	A	35	ARG
3	F	309	GLN
4	H	242	VAL
4	H	245	THR
5	I	342	CYS
5	J	38	THR
2	D	191	PRO
4	G	555	ILE
5	I	466	ILE
5	J	467	VAL
6	L	259	GLY
1	B	292	PRO
4	G	540	PRO
1	B	253	PRO

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	257/265 (97%)	238 (93%)	19 (7%)	13	33
1	B	257/265 (97%)	240 (93%)	17 (7%)	15	37
2	C	286/338 (85%)	266 (93%)	20 (7%)	14	35
2	D	286/338 (85%)	269 (94%)	17 (6%)	18	39
3	E	249/529 (47%)	244 (98%)	5 (2%)	48	66
3	F	338/529 (64%)	329 (97%)	9 (3%)	39	61
4	G	305/561 (54%)	296 (97%)	9 (3%)	36	57
4	H	305/561 (54%)	295 (97%)	10 (3%)	33	55
5	I	389/649 (60%)	371 (95%)	18 (5%)	24	45
5	J	389/649 (60%)	372 (96%)	17 (4%)	25	47
6	K	219/273 (80%)	200 (91%)	19 (9%)	9	29
6	L	219/273 (80%)	193 (88%)	26 (12%)	5	18
7	M	319/449 (71%)	309 (97%)	10 (3%)	35	56
7	N	319/449 (71%)	302 (95%)	17 (5%)	20	41
8	O	16/246 (6%)	16 (100%)	0	100	100
8	P	119/246 (48%)	109 (92%)	10 (8%)	10	30
All	All	4272/6620 (64%)	4049 (95%)	223 (5%)	22	42

All (223) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	20	MET
1	A	21	THR
1	A	24	ILE
1	A	37	LYS
1	A	54	GLU
1	A	81	LEU
1	A	126	ILE
1	A	147	ILE
1	A	172	LYS
1	A	179	ILE
1	A	188	ILE
1	A	196	VAL
1	A	207	ILE
1	A	231	THR
1	A	237	VAL
1	A	255	ASP

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Mol	Chain	Res	Type
1	A	280	ILE
1	A	290	LEU
1	A	297	GLU
1	B	20	MET
1	B	21	THR
1	B	37	LYS
1	B	54	GLU
1	B	56	LEU
1	B	60	ILE
1	B	64	VAL
1	B	81	LEU
1	B	104	ARG
1	B	148	ARG
1	B	153	VAL
1	B	172	LYS
1	B	207	ILE
1	B	231	THR
1	B	237	VAL
1	B	242	LEU
1	B	272	ILE
2	C	20	VAL
2	C	24	THR
2	C	40	ILE
2	C	42	LEU
2	C	91	ILE
2	C	161	LEU
2	C	168	ILE
2	C	177	ILE
2	C	179	LEU
2	C	206	ARG
2	C	222	ASN
2	C	223	THR
2	C	238	ILE
2	C	278	VAL
2	C	298	LEU
2	C	308	ASP
2	C	322	LEU
2	C	346	ILE
2	C	363	ARG
2	C	366	TRP
2	D	24	THR
2	D	38	TYR

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Mol	Chain	Res	Type
2	D	42	LEU
2	D	44	THR
2	D	84	CYS
2	D	160	ASP
2	D	161	LEU
2	D	165	ILE
2	D	168	ILE
2	D	200	LEU
2	D	201	ILE
2	D	206	ARG
2	D	222	ASN
2	D	278	VAL
2	D	298	LEU
2	D	350	ILE
2	D	366	TRP
3	E	3	ILE
3	E	144	ILE
3	E	183	LEU
3	E	185	ASP
3	E	255	ILE
3	F	3	ILE
3	F	134	HIS
3	F	141	ILE
3	F	173	ASP
3	F	237	ILE
3	F	255	ILE
3	F	260	LEU
3	F	418	THR
3	F	423	ILE
4	G	284	TYR
4	G	296	MET
4	G	412	LEU
4	G	424	ILE
4	G	456	ILE
4	G	503	VAL
4	G	521	VAL
4	G	532	LEU
4	G	568	GLU
4	H	286	ILE
4	H	388	ASP
4	H	412	LEU
4	H	424	ILE

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Mol	Chain	Res	Type
4	H	456	ILE
4	H	503	VAL
4	H	523	PHE
4	H	563	LYS
4	H	565	LEU
4	H	576	ILE
5	I	41	MET
5	I	51	LEU
5	I	88	ASP
5	I	97	LEU
5	I	106	THR
5	I	113	ARG
5	I	122	LEU
5	I	127	ILE
5	I	139	VAL
5	I	181	GLU
5	I	211	ILE
5	I	231	ILE
5	I	273	ILE
5	I	307	VAL
5	I	333	LEU
5	I	339	ILE
5	I	345	ILE
5	I	374	ILE
5	J	32	LEU
5	J	41	MET
5	J	51	LEU
5	J	60	ILE
5	J	88	ASP
5	J	97	LEU
5	J	113	ARG
5	J	122	LEU
5	J	128	ILE
5	J	173	THR
5	J	213	ILE
5	J	247	GLN
5	J	273	ILE
5	J	333	LEU
5	J	339	ILE
5	J	357	ILE
5	J	467	VAL
6	K	11	ASN

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Mol	Chain	Res	Type
6	K	19	ILE
6	K	45	MET
6	K	54	ARG
6	K	59	ILE
6	K	79	GLU
6	K	97	LYS
6	K	112	LEU
6	K	124	GLU
6	K	129	THR
6	K	143	GLU
6	K	154	VAL
6	K	163	LYS
6	K	166	LEU
6	K	168	GLU
6	K	169	LEU
6	K	235	LEU
6	K	244	LEU
6	K	251	ILE
6	L	19	ILE
6	L	45	MET
6	L	47	LEU
6	L	54	ARG
6	L	59	ILE
6	L	76	VAL
6	L	79	GLU
6	L	88	ARG
6	L	90	VAL
6	L	92	SER
6	L	93	GLU
6	L	97	LYS
6	L	107	THR
6	L	119	PHE
6	L	124	GLU
6	L	127	TYR
6	L	143	GLU
6	L	163	LYS
6	L	165	VAL
6	L	168	GLU
6	L	169	LEU
6	L	205	LEU
6	L	235	LEU
6	L	244	LEU

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Mol	Chain	Res	Type
6	L	251	ILE
6	L	261	VAL
7	M	169	GLU
7	M	291	ILE
7	M	311	ILE
7	M	353	ILE
7	M	368	ILE
7	M	402	VAL
7	M	406	LEU
7	M	432	ILE
7	M	475	VAL
7	M	508	HIS
7	N	236	ILE
7	N	281	VAL
7	N	286	GLN
7	N	310	MET
7	N	311	ILE
7	N	314	ARG
7	N	318	ILE
7	N	343	LEU
7	N	353	ILE
7	N	359	ILE
7	N	371	LYS
7	N	406	LEU
7	N	426	ILE
7	N	432	ILE
7	N	443	VAL
7	N	494	GLU
7	N	511	LEU
8	P	159	ARG
8	P	166	LEU
8	P	168	ASP
8	P	170	LYS
8	P	171	LYS
8	P	174	PHE
8	P	180	ILE
8	P	191	LEU
8	P	213	ILE
8	P	221	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (104) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	161	GLN
1	A	163	ASN
1	A	222	ASN
1	A	277	GLN
1	B	80	ASN
1	B	82	HIS
1	B	222	ASN
2	C	59	HIS
2	C	156	GLN
2	C	167	ASN
2	C	222	ASN
2	C	235	GLN
2	C	237	ASN
2	C	335	ASN
2	C	352	ASN
2	D	222	ASN
2	D	275	ASN
2	D	336	GLN
2	D	371	GLN
3	E	86	GLN
3	E	133	HIS
3	E	156	GLN
3	E	164	ASN
3	E	181	GLN
3	E	221	GLN
3	E	258	HIS
3	E	262	ASN
3	E	265	ASN
3	E	286	GLN
3	E	310	GLN
3	E	313	ASN
3	E	388	ASN
3	E	399	ASN
3	F	86	GLN
3	F	164	ASN
3	F	181	GLN
3	F	186	GLN
3	F	219	GLN
3	F	262	ASN
3	F	265	ASN
3	F	274	ASN
3	F	313	ASN
3	F	399	ASN

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Mol	Chain	Res	Type
3	F	424	GLN
3	F	456	ASN
3	F	482	ASN
3	F	499	ASN
3	F	512	ASN
4	G	266	ASN
4	G	342	ASN
4	G	384	GLN
4	G	416	ASN
4	G	475	HIS
4	G	574	ASN
4	H	446	ASN
4	H	480	ASN
4	H	500	ASN
4	H	524	ASN
5	I	28	GLN
5	I	73	HIS
5	I	85	GLN
5	I	87	ASN
5	I	124	ASN
5	I	212	GLN
5	I	228	ASN
5	I	296	GLN
5	I	335	GLN
5	I	405	ASN
5	I	423	ASN
5	J	87	ASN
5	J	142	ASN
5	J	156	HIS
5	J	212	GLN
5	J	228	ASN
5	J	387	ASN
5	J	405	ASN
5	J	423	ASN
5	J	460	GLN
6	K	41	ASN
6	L	23	ASN
6	L	68	ASN
6	L	103	GLN
7	M	98	GLN
7	M	111	HIS
7	M	151	GLN

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Mol	Chain	Res	Type
7	M	197	HIS
7	M	226	GLN
7	M	248	GLN
7	M	295	ASN
7	M	384	GLN
7	M	415	GLN
7	M	433	ASN
7	M	450	GLN
7	M	465	ASN
7	M	508	HIS
8	O	140	ASN
7	N	102	ASN
7	N	295	ASN
7	N	415	GLN
7	N	450	GLN
7	N	508	HIS
8	P	140	ASN
8	P	221	GLN
8	P	224	ASN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
6	SEP	L	52	6	8,9,10	0.66	0	7,12,14	1.26	1 (14%)
6	SEP	K	52	6	8,9,10	0.66	0	7,12,14	1.16	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	SEP	L	52	6	-	2/6/8/10	-
6	SEP	K	52	6	-	2/6/8/10	-

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
6	L	52	SEP	OG-CB-CA	2.16	110.24	108.14

There are no chirality outliers.

All (4) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	K	52	SEP	N-CA-CB-OG
6	K	52	SEP	C-CA-CB-OG
6	L	52	SEP	N-CA-CB-OG
6	L	52	SEP	C-CA-CB-OG

There are no ring outliers.

No monomer is involved in short contacts.

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

The following chains have linkage breaks:

Mol	Chain	Number of breaks
3	F	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	F	413:SER	C	414:GLN	N	9.52

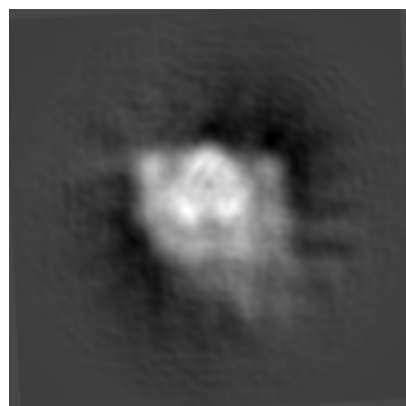
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-4546. These allow visual inspection of the internal detail of the map and identification of artifacts.

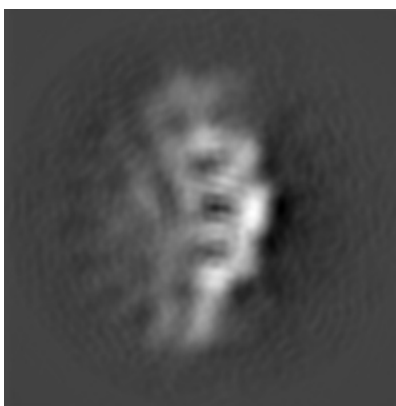
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

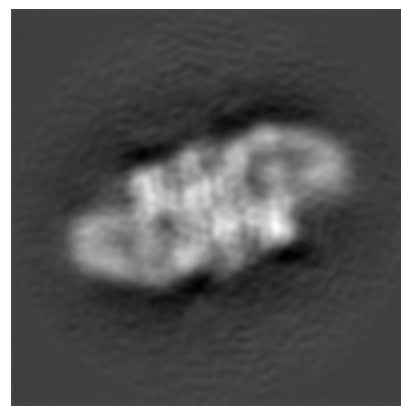
6.1.1 Primary map



X

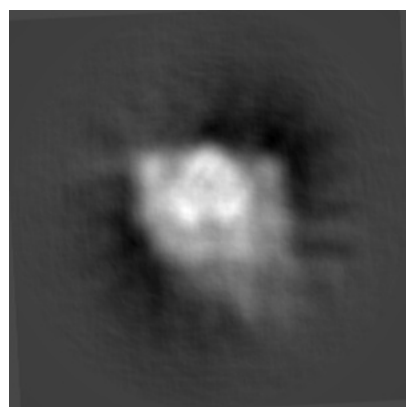


Y

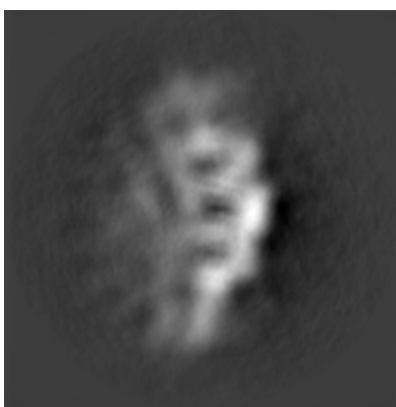


Z

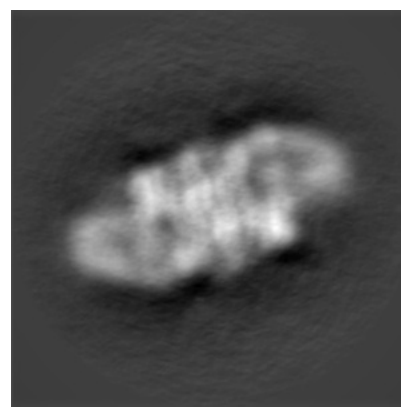
6.1.2 Raw map



X



Y

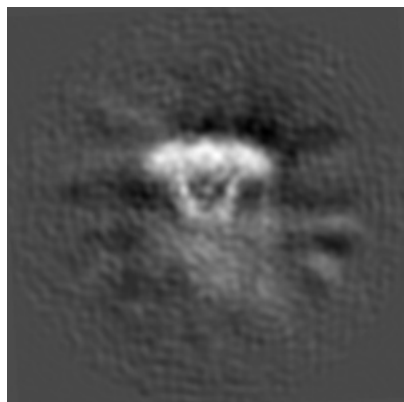


Z

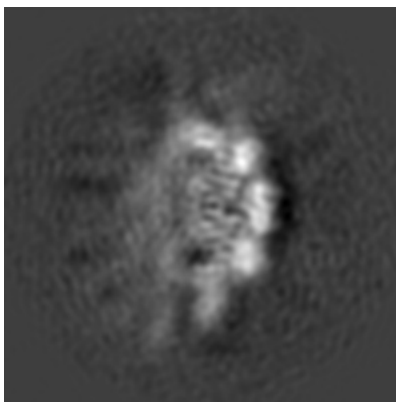
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

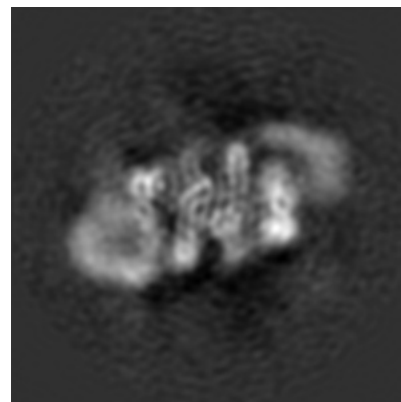
6.2.1 Primary map



X Index: 140

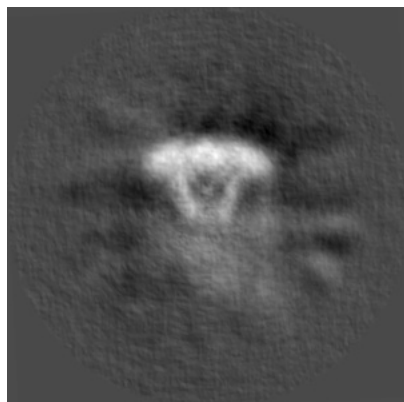


Y Index: 140

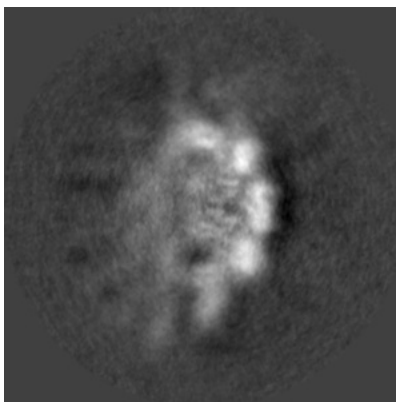


Z Index: 140

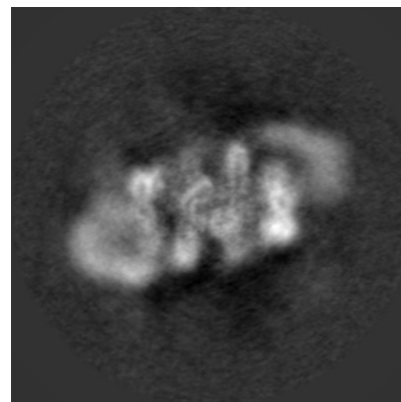
6.2.2 Raw map



X Index: 140



Y Index: 140

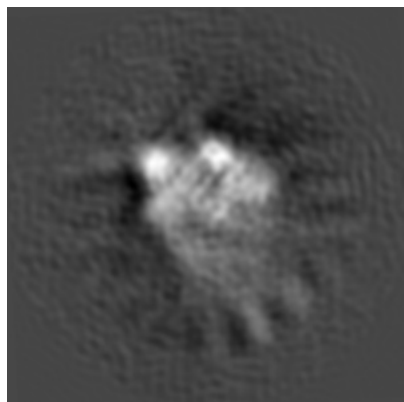


Z Index: 140

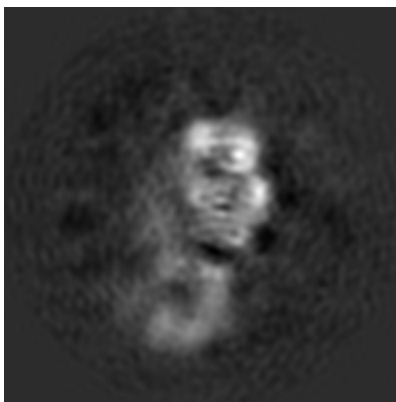
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

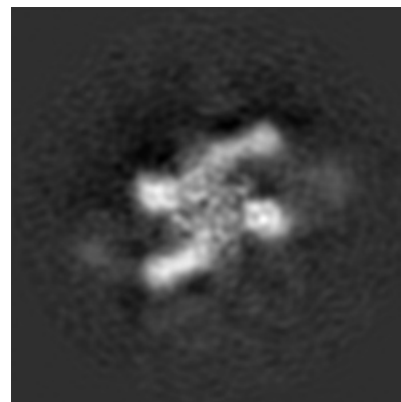
6.3.1 Primary map



X Index: 127

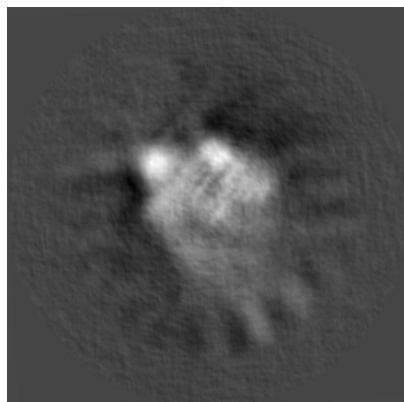


Y Index: 128

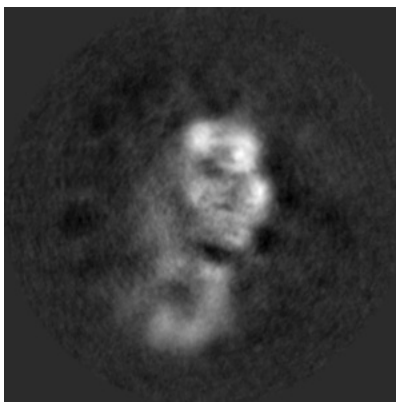


Z Index: 168

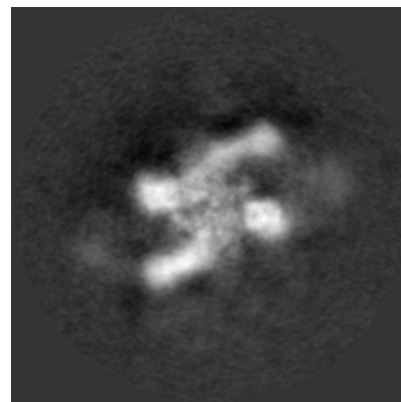
6.3.2 Raw map



X Index: 127



Y Index: 128

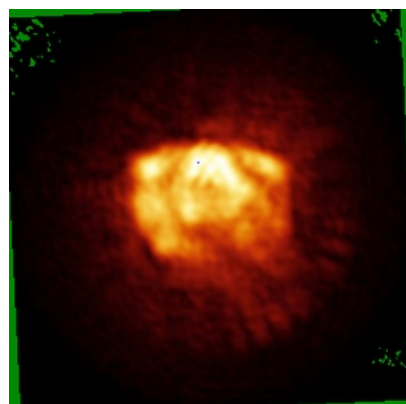


Z Index: 168

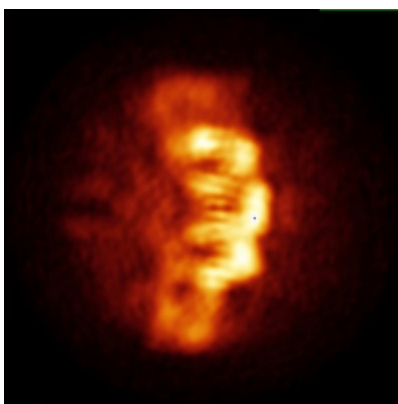
The images above show the largest variance slices of the map in three orthogonal directions.

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

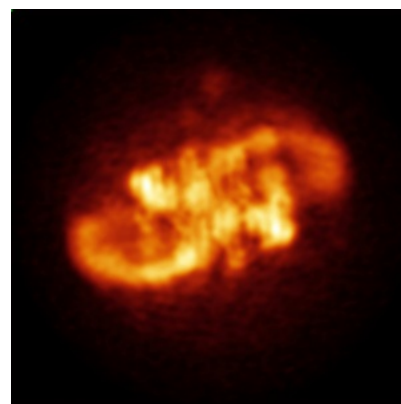
6.4.1 Primary map



X

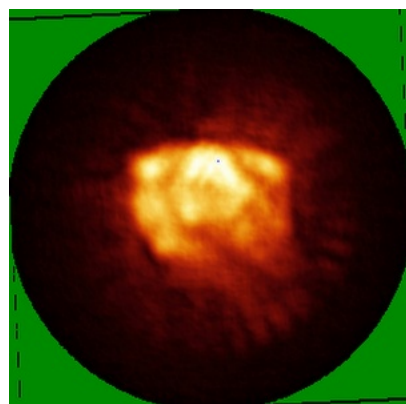


Y

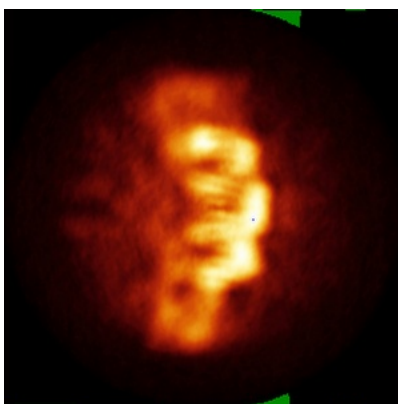


Z

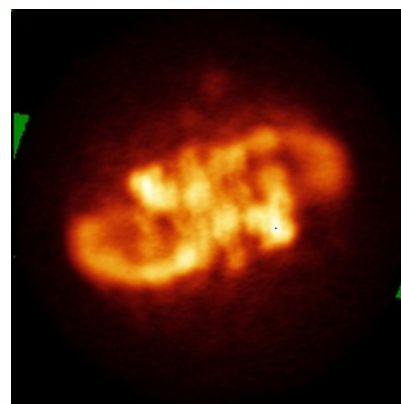
6.4.2 Raw map



X



Y

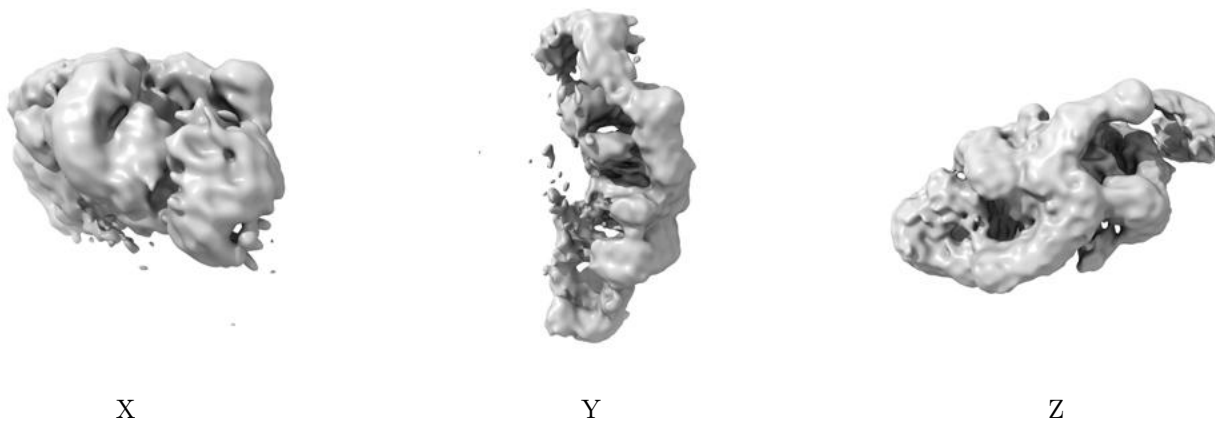


Z

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 0.03. 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.

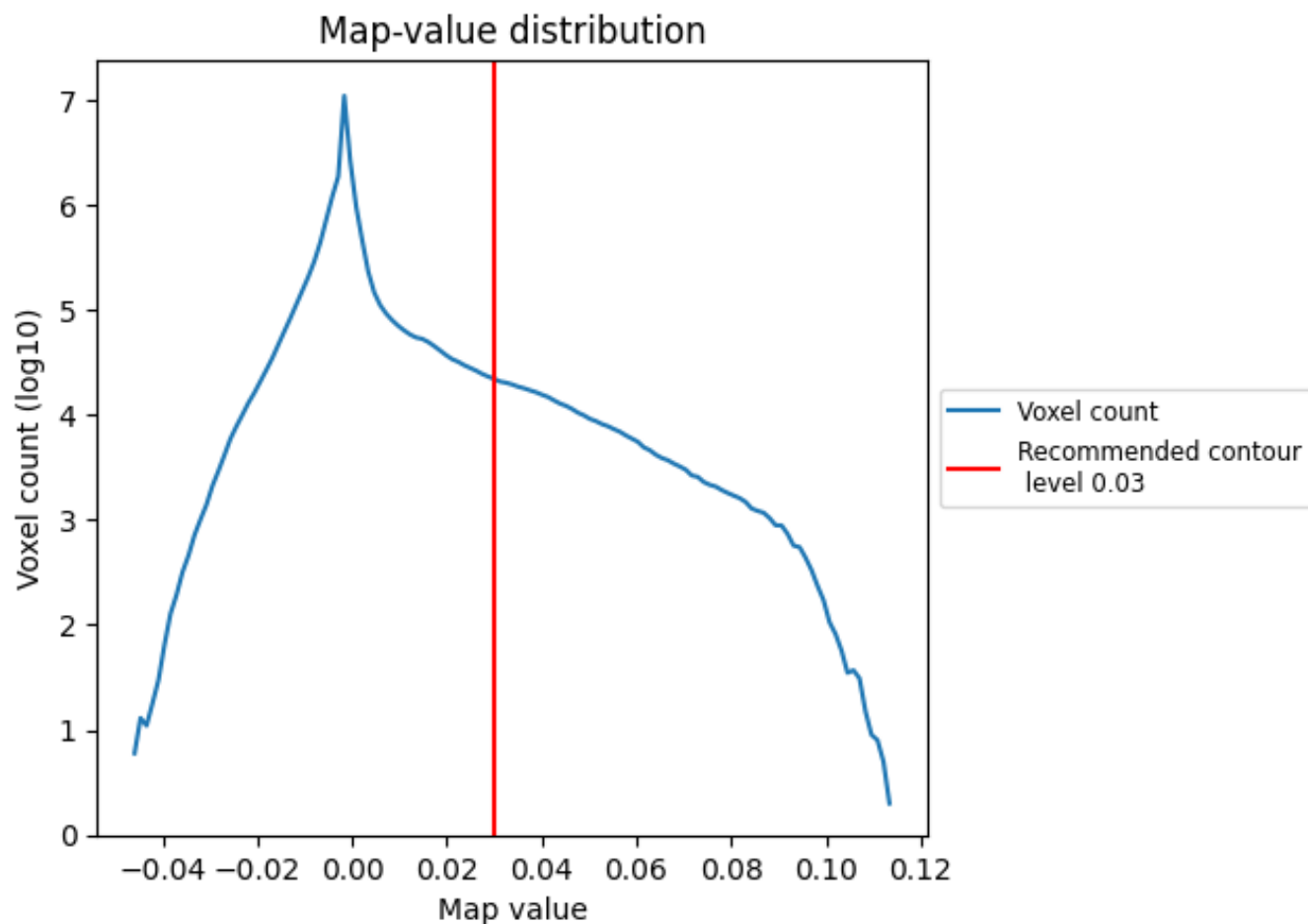
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

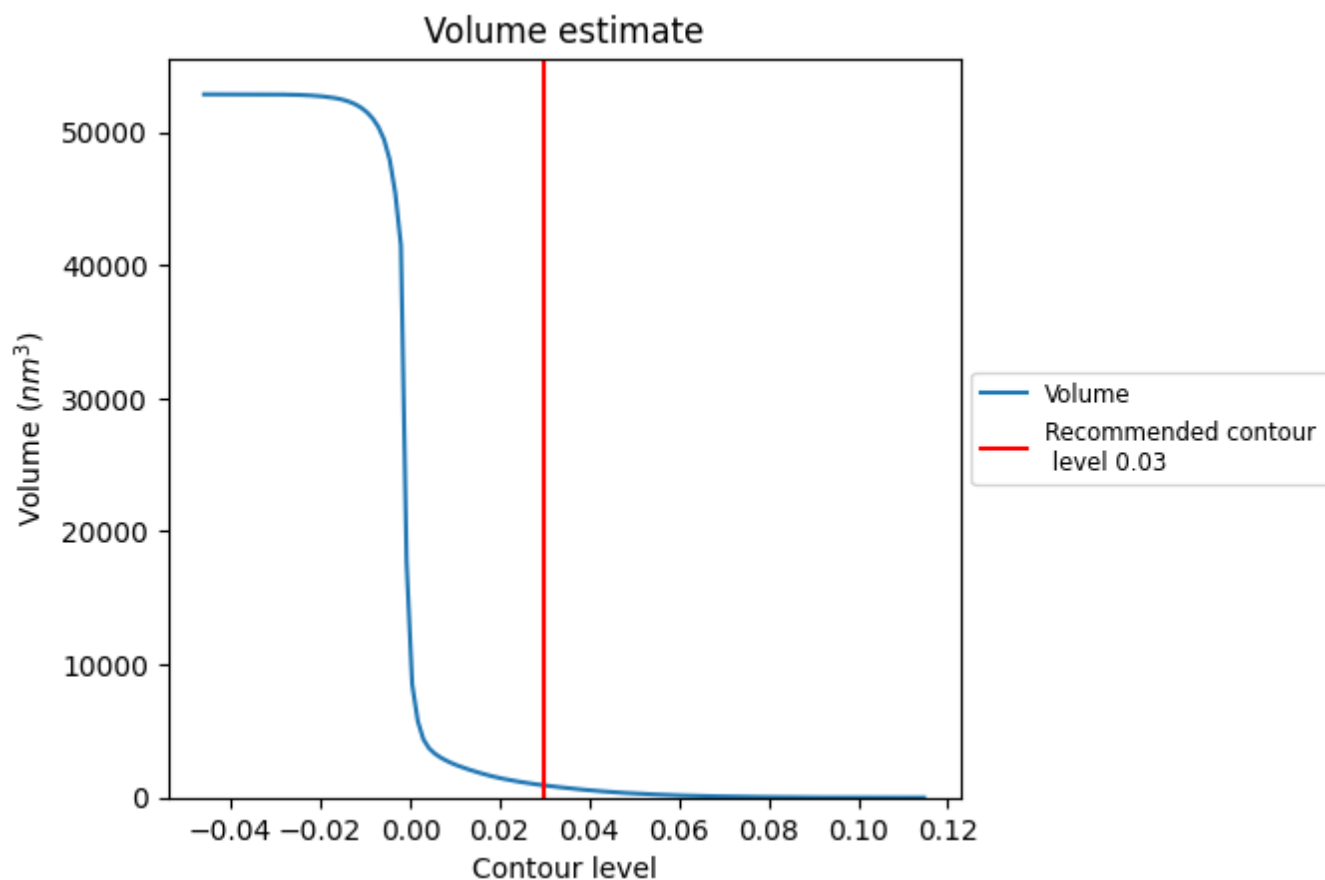
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

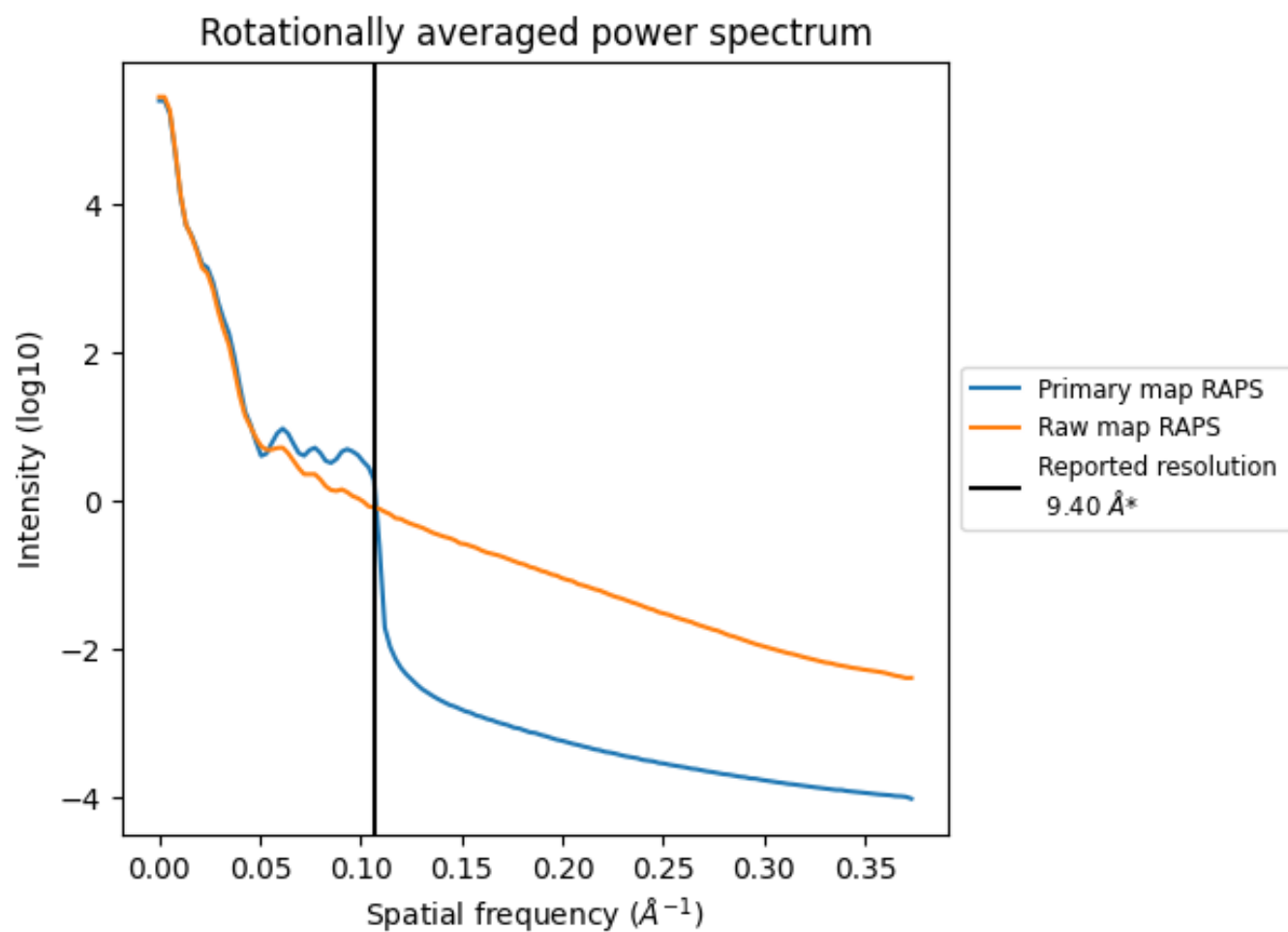
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 913 nm³; this corresponds to an approximate mass of 825 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 ⓘ

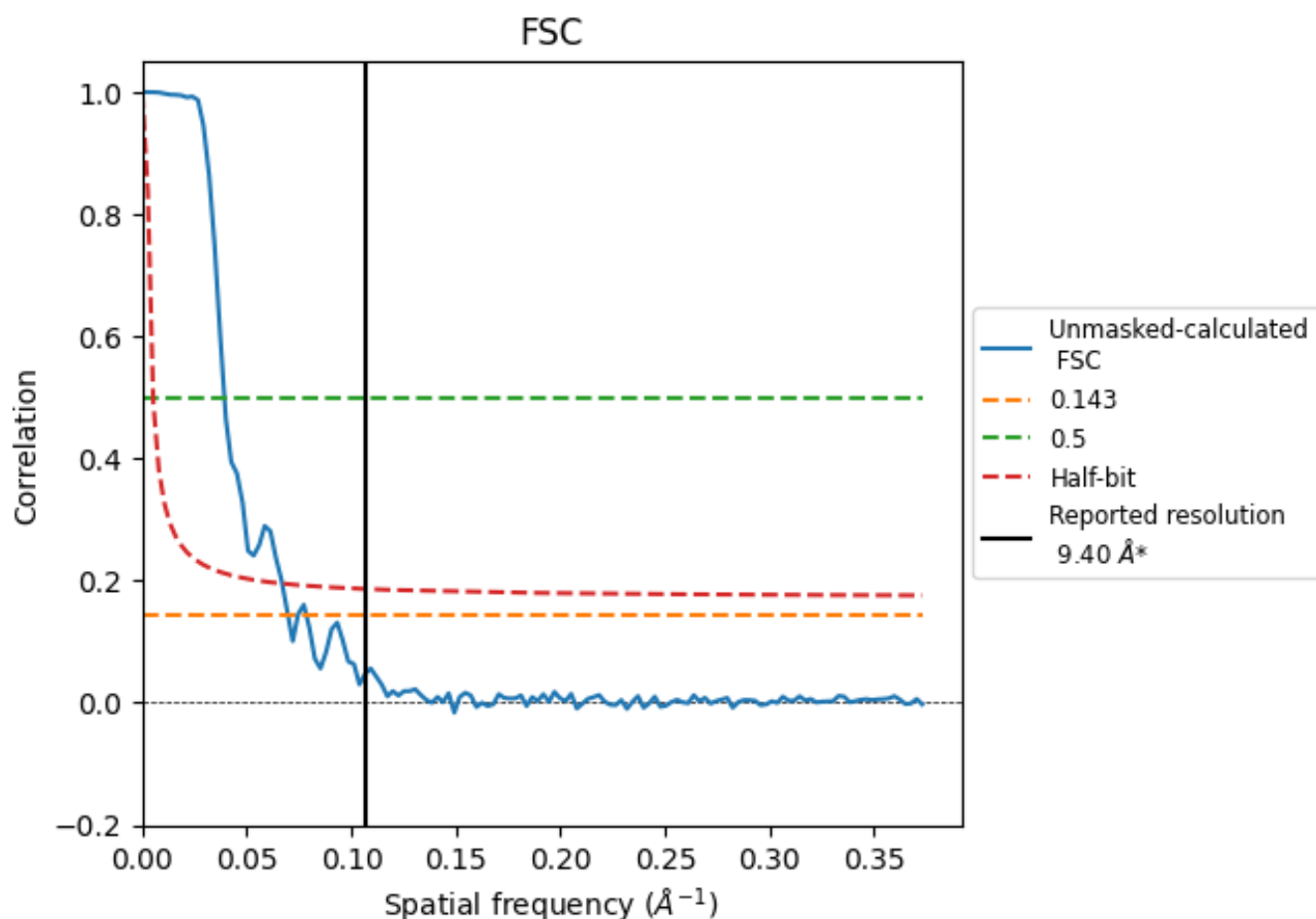


*Reported resolution corresponds to spatial frequency of 0.106 Å⁻¹

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 0.106 Å⁻¹

8.2 Resolution estimates [i](#)

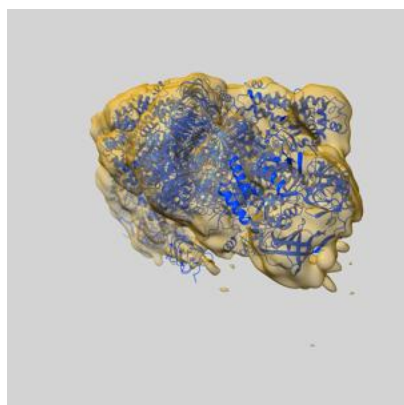
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	9.40	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	14.35	25.45	14.93

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 14.35 differs from the reported value 9.4 by more than 10 %

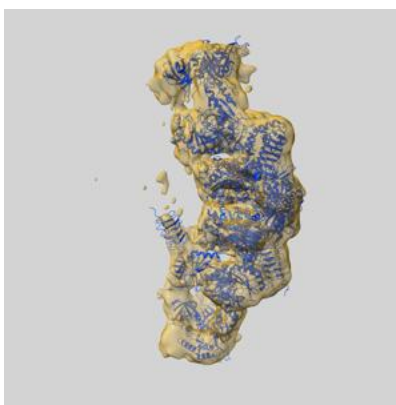
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-4546 and PDB model 6QG3. Per-residue inclusion information can be found in section 3 on page 6.

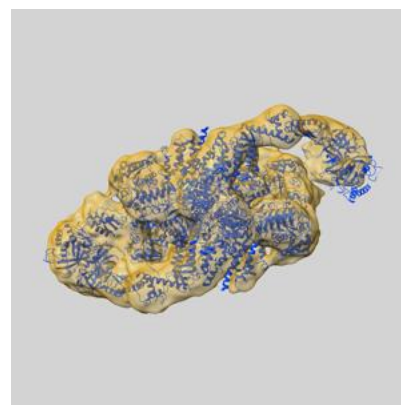
9.1 Map-model overlay [i](#)



X



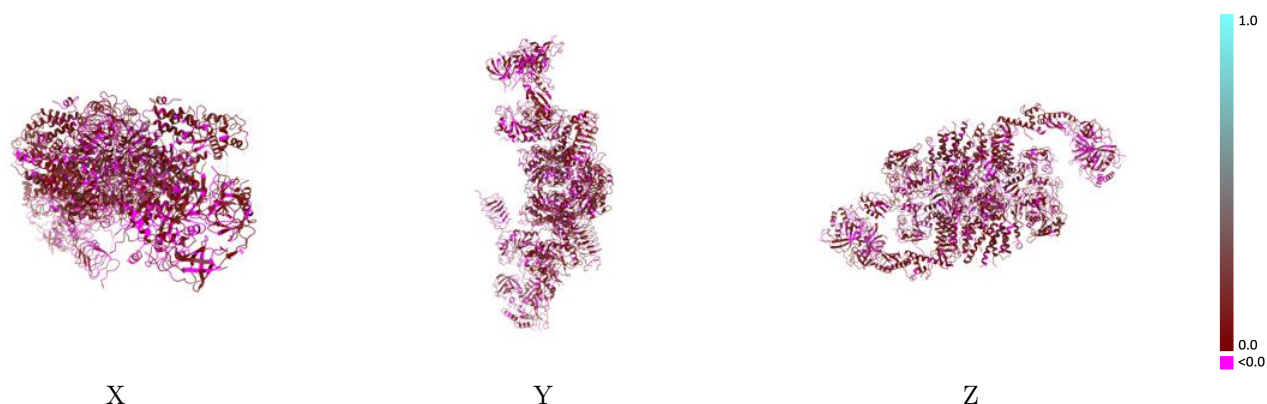
Y



Z

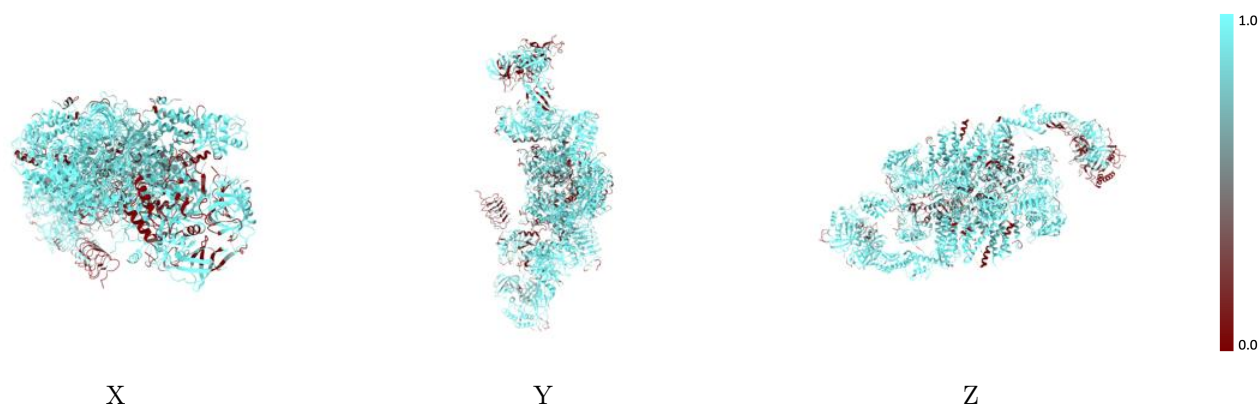
The images above show the 3D surface view of the map at the recommended contour level 0.03 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



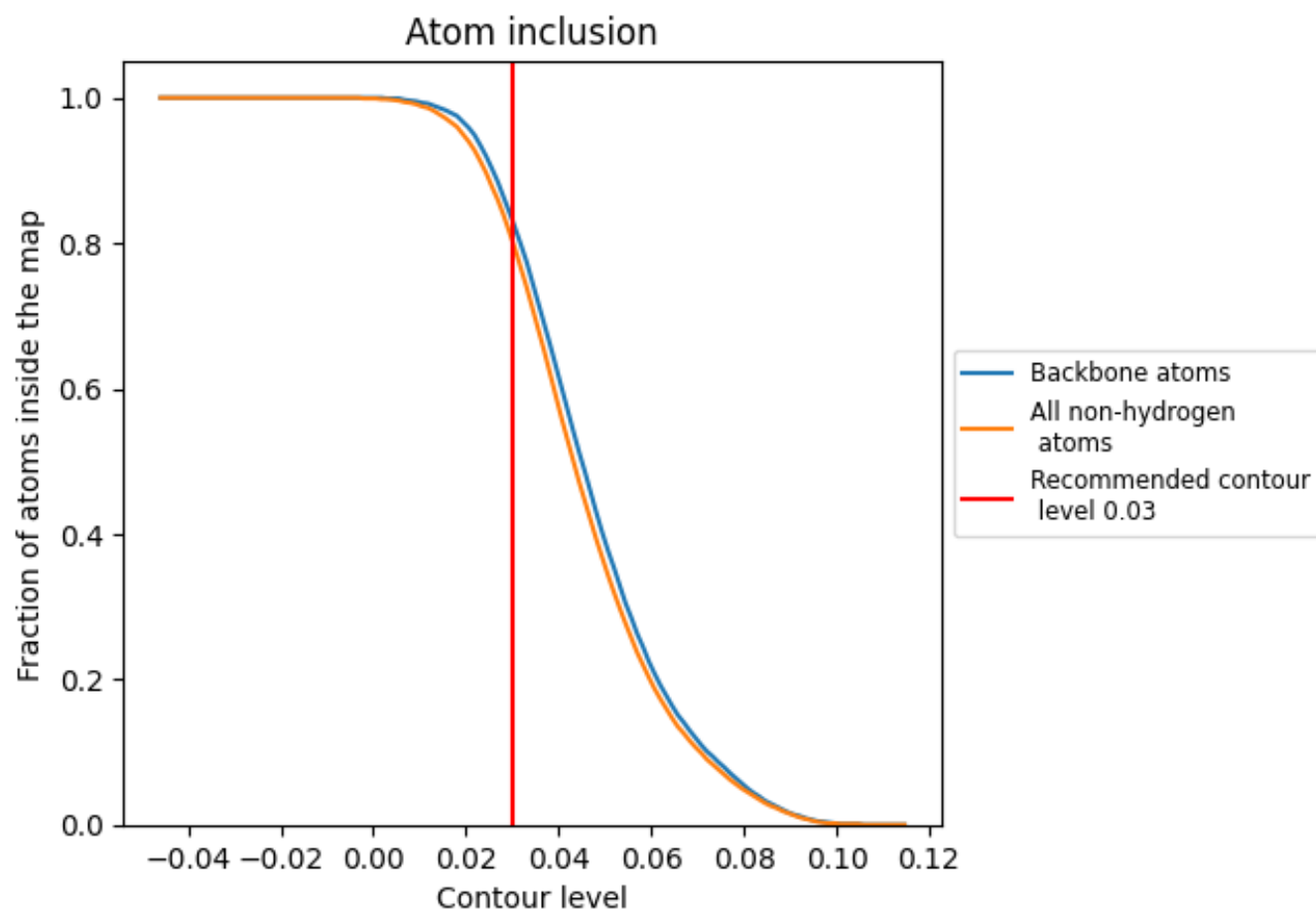
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.03).

9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 80% 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 (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8040	 0.0670
A	 0.9060	 0.0720
B	 0.8950	 0.0680
C	 0.7920	 0.0800
D	 0.7620	 0.0720
E	 0.8800	 0.0440
F	 0.5780	 0.0430
G	 0.7620	 0.0860
H	 0.6800	 0.0870
I	 0.9270	 0.0770
J	 0.9520	 0.0870
K	 0.7800	 0.0760
L	 0.9600	 0.0700
M	 0.5660	 0.0340
N	 0.8550	 0.0450
O	 0.0000	 0.0140
P	 0.9520	 0.0760

