Full wwPDB EM Validation Report

Nov 14, 2026 – 09:17 am GMT

PDB ID	:	32QC / pdb_000032qc
EMDB ID	:	EMD-59067
Title	:	Structure of 3' cRNA bound avian H5N1 influenza A polymerase heterotrimer in complex with WSN NEP (Replicase conformation).
Authors	:	Chen, K.; Rep, A.; Wang, F.; Staller, E.; Carrique, L.; Grimes, J.M.; Fodor, E.
Deposited on	:	2026-07-20
Resolution	:	2.60 Å(reported)
Based on initial model	:	8R1J

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:

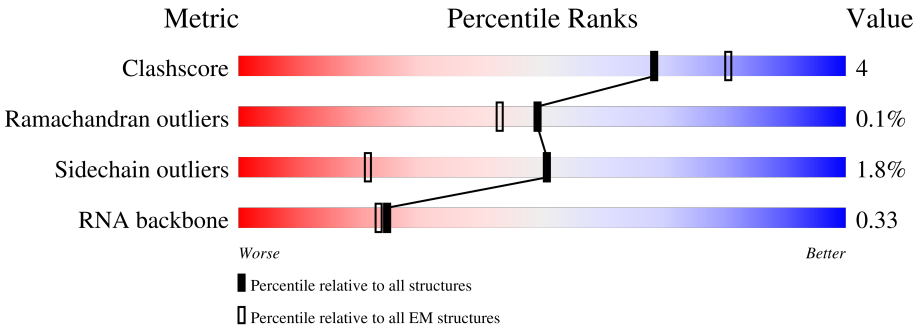
EMDB validation analysis	:	0.0.1.dev133
MolProbity	:	4-5-2 with Phenix2.2
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

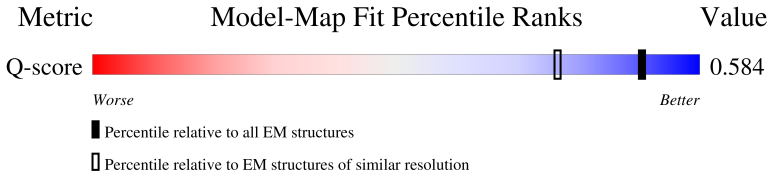
1 Overall quality at a glance

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

The reported resolution of this entry is 2.60 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	-
RNA backbone	8273	3508	-
Q-score	-	25397	8728 (2.10 - 3.10)

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 <=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	716	14% 91% 8%
2	D	130	58% 72% 16% 12%
3	E	15	7% 27% 13% 60%

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Mol	Chain	Length	Quality of chain
4	B	757	
5	C	898	

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 28937 atoms, of which 14370 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 Polymerase acidic protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	710	11449	3642	5703	975	1088	41	0	0

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	initiating methionine	UNP A5Z236
A	2	GLU	-	expression tag	UNP A5Z236
A	3	ASP	-	expression tag	UNP A5Z236
A	97	ILE	THR	engineered mutation	UNP A5Z236
A	349	LYS	GLU	engineered mutation	UNP A5Z236
A	556	ARG	GLN	engineered mutation	UNP A5Z236

- Molecule 2 is a protein called Nuclear export protein.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
2	D	115	1919	604	961	168	180	6	0	0

There are 10 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
D	-8	GLY	-	expression tag	UNP Q89733
D	-7	PRO	-	expression tag	UNP Q89733
D	-6	LEU	-	expression tag	UNP Q89733
D	-5	GLY	-	expression tag	UNP Q89733
D	-4	SER	-	expression tag	UNP Q89733
D	-3	PRO	-	expression tag	UNP Q89733
D	-2	GLU	-	expression tag	UNP Q89733
D	-1	PHE	-	expression tag	UNP Q89733
D	0	CYS	-	expression tag	UNP Q89733
D	3	SER	PRO	conflict	UNP Q89733

- Molecule 3 is a RNA chain called RNA (5'-R(P*UP*CP*UP*AP*CP*U)-3').

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	6	Total	C	N	O	P	0	0
			122	55	17	44	6		

- Molecule 4 is a protein called RNA-directed RNA polymerase catalytic subunit.

Mol	Chain	Residues	Atoms						AltConf	Trace
4	B	682	Total	C	H	N	O	S	0	0
			10786	3444	5336	934	1030	42		

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	1	MET	-	initiating methionine	UNP A5Z231
B	2	ASP	-	expression tag	UNP A5Z231
B	3	VAL	-	expression tag	UNP A5Z231
B	577	GLU	LYS	engineered mutation	UNP A5Z231

- Molecule 5 is a protein called Polymerase basic protein 2,Immunoglobulin G-binding protein A.

Mol	Chain	Residues	Atoms						AltConf	Trace
5	C	283	Total	C	H	N	O	S	0	0
			4661	1453	2370	415	407	16		

There are 41 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	1	MET	-	initiating methionine	UNP A5Z230
C	2	GLU	-	expression tag	UNP A5Z230
C	3	ARG	-	expression tag	UNP A5Z230
C	4	ILE	-	expression tag	UNP A5Z230
C	5	LYS	-	expression tag	UNP A5Z230
C	6	GLU	-	expression tag	UNP A5Z230
C	7	LEU	-	expression tag	UNP A5Z230
C	701	ASN	ASP	engineered mutation	UNP A5Z230
C	702	ARG	LYS	engineered mutation	UNP A5Z230
C	714	ARG	SER	engineered mutation	UNP A5Z230
C	761	LEU	ALA	conflict	UNP Q70AB8
C	763	THR	LYS	conflict	UNP Q70AB8
C	764	ALA	LEU	conflict	UNP Q70AB8
C	765	ALA	ASN	conflict	UNP Q70AB8

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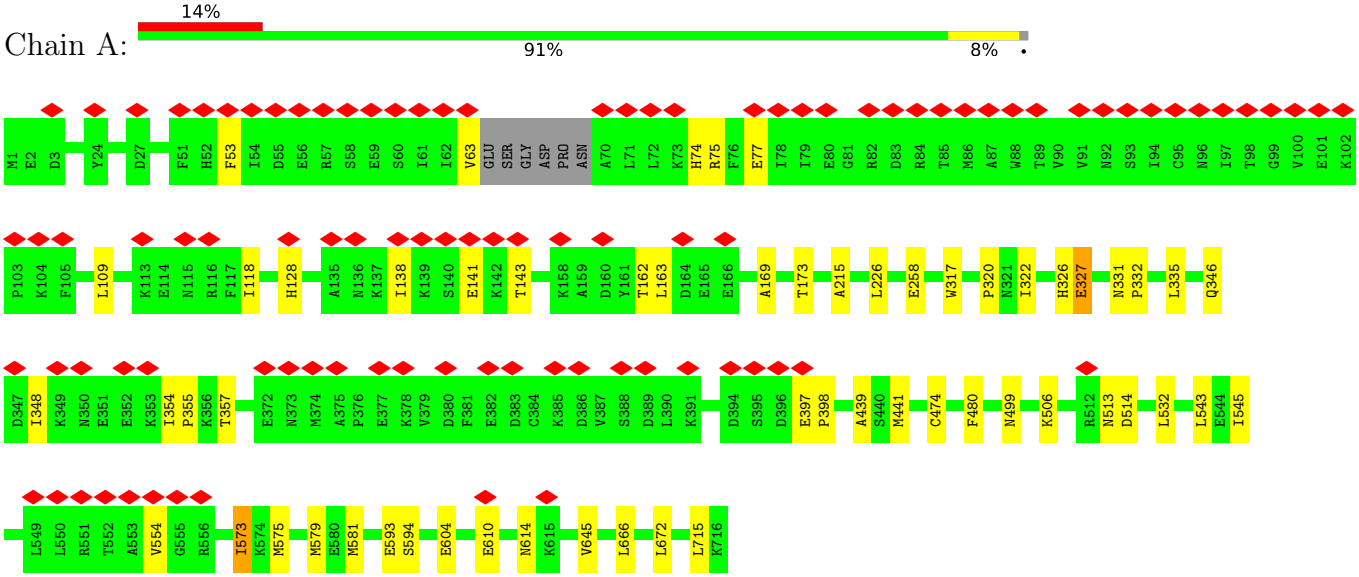
Chain	Residue	Modelled	Actual	Comment	Reference
C	766	LEU	GLU	conflict	UNP Q70AB8
C	767	ALA	SER	conflict	UNP Q70AB8
C	769	HIS	ALA	conflict	UNP Q70AB8
C	770	ASP	PRO	conflict	UNP Q70AB8
C	771	GLU	LYS	conflict	UNP Q70AB8
C	773	VAL	-	insertion	UNP Q70AB8
C	776	LYS	ASN	conflict	UNP Q70AB8
C	790	HIS	ASN	conflict	UNP Q70AB8
C	791	LEU	MET	conflict	UNP Q70AB8
C	801	ALA	GLY	conflict	UNP Q70AB8
C	818	ALA	SER	conflict	UNP Q70AB8
C	825	ASP	GLU	conflict	UNP Q70AB8
C	826	ALA	SER	conflict	UNP Q70AB8
C	831	VAL	ALA	conflict	UNP Q70AB8
C	859	ALA	GLY	conflict	UNP Q70AB8
C	866	ALA	ASP	conflict	UNP Q70AB8
C	883	GLY	ASP	conflict	UNP Q70AB8
C	889	VAL	-	expression tag	UNP Q70AB8
C	890	ASP	-	expression tag	UNP Q70AB8
C	891	ALA	-	expression tag	UNP Q70AB8
C	892	ASN	-	expression tag	UNP Q70AB8
C	893	SER	-	expression tag	UNP Q70AB8
C	894	ALA	-	expression tag	UNP Q70AB8
C	895	GLY	-	expression tag	UNP Q70AB8
C	896	LYS	-	expression tag	UNP Q70AB8
C	897	SER	-	expression tag	UNP Q70AB8
C	898	THR	-	expression tag	UNP Q70AB8

3 Residue-property plots (i)

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

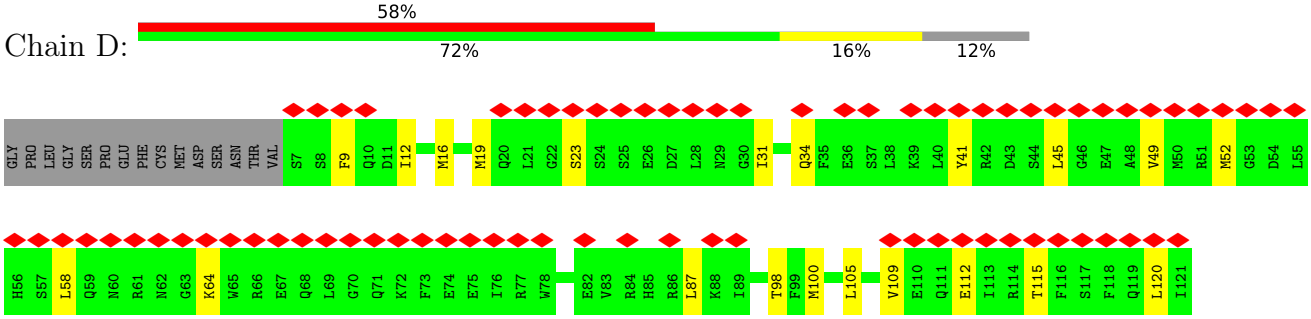
• Molecule 1: Polymerase acidic protein

Chain A:



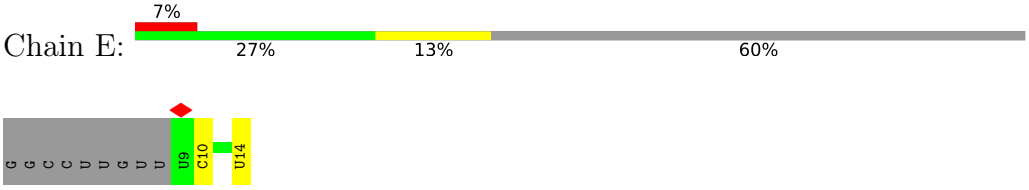
• Molecule 2: Nuclear export protein

Chain D:



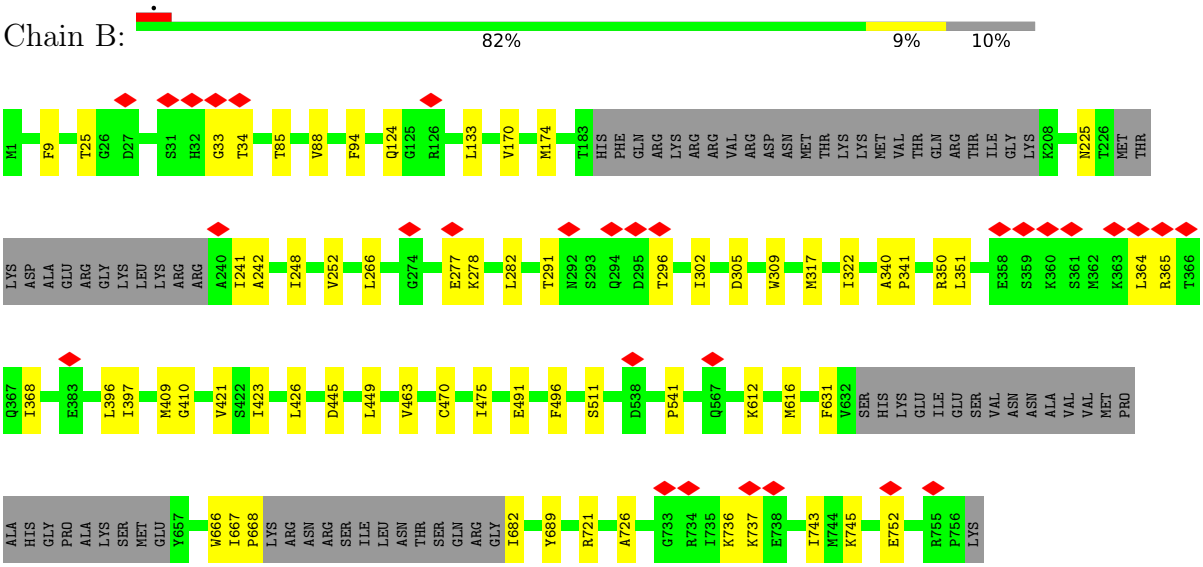
• Molecule 3: RNA (5'-R(P*UP*CP*UP*AP*CP*U)-3')

Chain E:



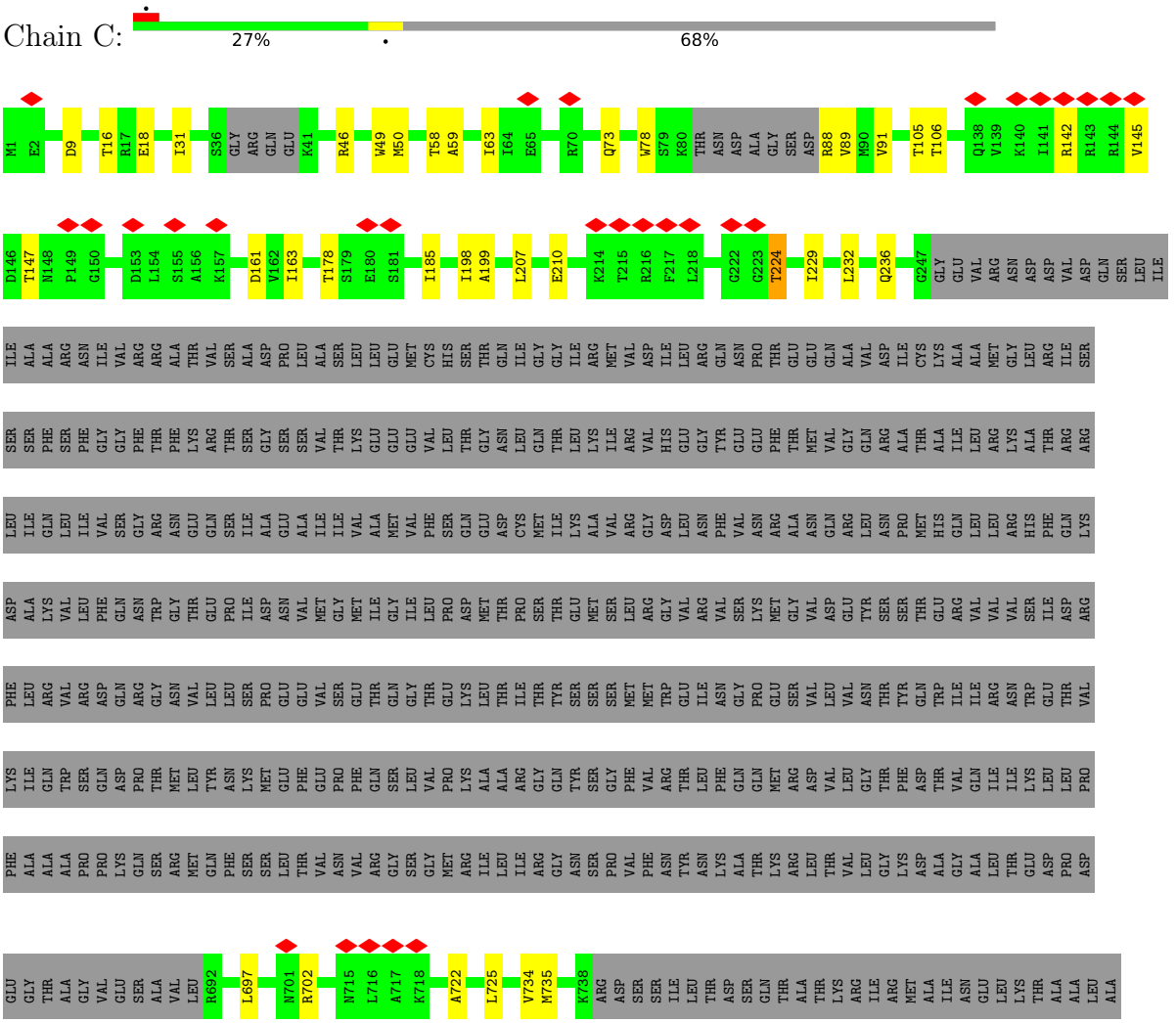
• Molecule 4: RNA-directed RNA polymerase catalytic subunit

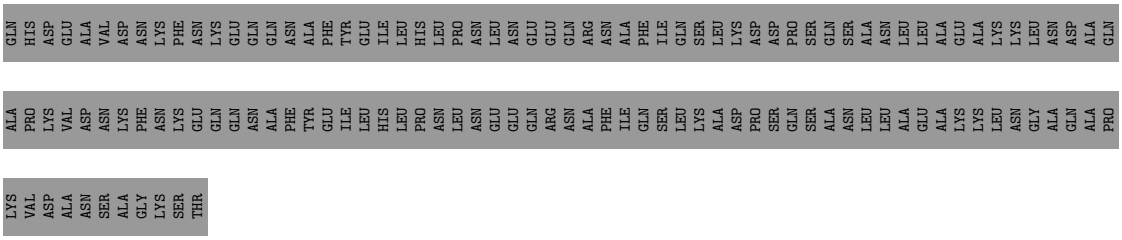
Chain B:



• Molecule 5: Polymerase basic protein 2,Immunoglobulin G-binding protein A

Chain C:




GLN HIS ASP GLU ALA VAL ASP ASN LYS PHE ASN LYS GLU GLN GLN ASN ALA PHE TYR GLU ILE LEU HIS LEU PRO ASN LEU ASN GLU GLU GLN GLN ARG ASN ALA PHE ILE GLN SER LEU LYS ASP ASP PRO SER GLN SER ALA ASN LEU LEU ALA GLU ALA LYS LYS LEU ASN ASP ALA GLN
ALA PRO LYS VAL ASP ASN LYS PHE ASN LYS GLU GLN GLN ASN ALA PHE TYR GLU ILE LEU HIS LEU PRO ASN LEU ASN GLU GLU GLN ARG ASN ALA PHE ILE GLN SER LEU LYS ALA ASP PRO SER GLN SER ALA ASN LEU LEU ALA GLU ALA LYS LYS LEU ASN GLY ALA GLN ALA PRO
LYS VAL ASP ALA ASN SER ALA GLY LYS SER THR

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	35000	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 ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	10000	Depositor
Maximum defocus (nm)	24000	Depositor
Magnification	Not provided	
Image detector	TFS FALCON 4i (4k x 4k)	Depositor
Maximum map value	0.884	Depositor
Minimum map value	-0.673	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.017	Depositor
Recommended contour level	0.1	Depositor
Map size (Å)	372.8, 372.8, 372.8	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.932, 0.932, 0.932	Depositor

5 Model quality

5.1 Standard geometry

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	0.20	0/5866	0.29	0/7901
2	D	0.13	0/971	0.26	0/1297
3	E	0.28	0/134	0.63	0/205
4	B	0.20	0/5558	0.30	0/7502
5	C	0.15	0/2331	0.29	0/3135
All	All	0.19	0/14860	0.30	0/20040

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5746	5703	5704	34	0
2	D	958	961	960	17	0
3	E	122	0	64	0	0
4	B	5450	5336	5417	40	0
5	C	2291	2370	2382	31	0
All	All	14567	14370	14527	108	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 (108) 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:554:VAL:HG13	2:D:49:VAL:HG21	1.55	0.87
4:B:668:PRO:HB2	5:C:50:MET:HE1	1.62	0.80
5:C:185:ILE:H	5:C:185:ILE:HD12	1.54	0.72
1:A:672:LEU:HD23	1:A:715:LEU:HD22	1.73	0.68
5:C:78:TRP:HB3	5:C:91:VAL:HG22	1.79	0.64
1:A:666:LEU:HD21	4:B:9:PHE:CE2	2.34	0.62
4:B:364:LEU:HD12	4:B:365:ARG:N	2.14	0.62
1:A:77:GLU:O	1:A:109:LEU:HD12	1.99	0.61
1:A:320:PRO:HB2	1:A:335:LEU:HD11	1.83	0.60
4:B:302:ILE:HD12	4:B:449:LEU:HD23	1.82	0.60
4:B:631:PHE:HB3	4:B:666:TRP:HB3	1.83	0.59
1:A:169:ALA:HB2	5:C:697:LEU:HD23	1.85	0.59
5:C:145:VAL:HG11	5:C:229:ILE:HG21	1.85	0.59
2:D:105:LEU:O	2:D:109:VAL:HG23	2.03	0.58
5:C:697:LEU:HD21	5:C:735:MET:HE2	1.84	0.58
5:C:697:LEU:HD11	5:C:735:MET:HB2	1.86	0.56
1:A:162:THR:O	1:A:163:LEU:HD23	2.06	0.56
1:A:326:HIS:O	1:A:327:GLU:CB	2.53	0.56
4:B:317:MET:HA	4:B:317:MET:HE2	1.88	0.56
5:C:78:TRP:CB	5:C:91:VAL:HG22	2.37	0.55
4:B:296:THR:O	4:B:296:THR:HG22	2.05	0.55
2:D:87:LEU:HD21	2:D:100:MET:HE2	1.90	0.54
1:A:474:CYS:HG	5:C:49:TRP:CD1	2.26	0.54
2:D:12:ILE:O	2:D:16:MET:HG3	2.08	0.54
5:C:9:ASP:OD2	5:C:9:ASP:C	2.52	0.53
4:B:667:ILE:HG23	5:C:58:THR:OG1	2.09	0.53
4:B:302:ILE:HD11	4:B:463:VAL:HG22	1.91	0.52
2:D:12:ILE:HD12	2:D:105:LEU:HD22	1.93	0.51
4:B:94:PHE:HD2	4:B:426:LEU:HD21	1.76	0.51
1:A:317:TRP:HZ3	1:A:545:ILE:HD12	1.76	0.51
5:C:232:LEU:HD22	5:C:236:GLN:OE1	2.10	0.50
4:B:277:GLU:N	4:B:277:GLU:OE1	2.44	0.50
2:D:41:TYR:CZ	2:D:45:LEU:HD21	2.47	0.49
4:B:278:LYS:O	4:B:282:LEU:HD13	2.12	0.49
1:A:439:ALA:HB2	4:B:541:PRO:HB2	1.93	0.49
2:D:112:GLU:OE2	2:D:112:GLU:O	2.29	0.49
4:B:133:LEU:HG	4:B:682:ILE:HD13	1.94	0.49
2:D:31:ILE:HD12	2:D:31:ILE:N	2.27	0.49
1:A:173:THR:CG2	5:C:178:THR:HG21	2.43	0.48
4:B:423:ILE:HG21	4:B:470:CYS:SG	2.53	0.48
4:B:721:ARG:HH21	5:C:725:LEU:HD22	1.78	0.48
2:D:19:MET:HE2	2:D:98:THR:HG21	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:346:GLN:HA	1:A:346:GLN:OE1	2.13	0.48
1:A:138:ILE:HG22	1:A:141:GLU:OE1	2.13	0.48
4:B:689:TYR:CD1	5:C:31:ILE:HG23	2.49	0.48
4:B:667:ILE:HG13	4:B:668:PRO:HD2	1.96	0.47
4:B:225:ASN:O	4:B:242:ALA:HA	2.15	0.47
4:B:309:TRP:HZ3	4:B:475:ILE:HG23	1.80	0.47
4:B:668:PRO:CB	5:C:50:MET:HE1	2.40	0.47
2:D:49:VAL:HG13	2:D:52:MET:HE3	1.97	0.46
5:C:46:ARG:HD3	5:C:50:MET:SD	2.55	0.46
4:B:667:ILE:HG23	5:C:58:THR:HG1	1.81	0.46
2:D:41:TYR:O	2:D:45:LEU:HD23	2.15	0.46
2:D:31:ILE:HD12	2:D:31:ILE:H	1.80	0.46
4:B:726:ALA:HB2	4:B:743:ILE:HG21	1.97	0.46
1:A:397:GLU:N	1:A:398:PRO:CD	2.79	0.46
1:A:575:MET:O	1:A:579:MET:HG3	2.16	0.45
1:A:514:ASP:HB3	1:A:573:ILE:HG12	1.99	0.45
5:C:63:ILE:HD13	5:C:91:VAL:HG21	1.99	0.44
2:D:52:MET:HB2	2:D:58:LEU:HD11	2.00	0.44
4:B:351:LEU:HD11	4:B:396:LEU:HD22	1.99	0.44
5:C:59:ALA:O	5:C:88:ARG:HB3	2.18	0.44
1:A:322:ILE:HD13	1:A:331:ASN:HB3	2.00	0.44
4:B:340:ALA:HB3	4:B:341:PRO:HD3	1.99	0.44
5:C:142:ARG:HD2	5:C:142:ARG:N	2.33	0.44
1:A:74:HIS:O	1:A:75:ARG:HB3	2.18	0.44
1:A:480:PHE:HA	1:A:506:LYS:O	2.18	0.44
4:B:368:ILE:O	4:B:368:ILE:HG13	2.18	0.44
5:C:702:ARG:N	5:C:702:ARG:HD3	2.33	0.44
1:A:331:ASN:N	1:A:332:PRO:HD2	2.33	0.43
4:B:667:ILE:HG21	5:C:88:ARG:HH12	1.83	0.43
5:C:161:ASP:OD2	5:C:161:ASP:C	2.60	0.43
1:A:215:ALA:HB1	1:A:226:LEU:HD22	2.01	0.43
1:A:354:ILE:HG22	1:A:355:PRO:HD2	2.01	0.43
4:B:33:GLY:O	4:B:34:THR:HG23	2.19	0.43
4:B:721:ARG:O	4:B:721:ARG:HD3	2.18	0.43
5:C:145:VAL:HG13	5:C:224:THR:O	2.18	0.43
4:B:491:GLU:HG3	4:B:496:PHE:CE2	2.54	0.43
5:C:163:ILE:HD12	5:C:207:LEU:HB3	2.01	0.42
4:B:396:LEU:O	4:B:397:ILE:HG13	2.18	0.42
5:C:722:ALA:O	5:C:734:VAL:HG12	2.19	0.42
1:A:581:MET:HE1	1:A:645:VAL:HG13	2.00	0.42
1:A:593:GLU:O	1:A:594:SER:C	2.63	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:19:MET:CE	2:D:98:THR:HG21	2.50	0.42
4:B:736:LYS:HG3	4:B:737:LYS:H	1.84	0.42
1:A:143:THR:O	1:A:143:THR:HG23	2.19	0.42
4:B:170:VAL:O	4:B:174:MET:HG2	2.20	0.42
2:D:58:LEU:HD13	2:D:120:LEU:HD22	2.02	0.42
4:B:409:MET:HE3	4:B:410:GLY:H	1.83	0.42
4:B:248:ILE:HG12	4:B:252:VAL:HG23	2.02	0.41
1:A:532:LEU:HB3	2:D:100:MET:HE1	2.02	0.41
1:A:604:GLU:OE2	1:A:604:GLU:HA	2.20	0.41
5:C:198:ILE:HG22	5:C:199:ALA:N	2.35	0.41
1:A:604:GLU:OE2	1:A:604:GLU:CA	2.69	0.41
1:A:610:GLU:O	1:A:614:ASN:HB3	2.21	0.41
5:C:163:ILE:N	5:C:163:ILE:HD13	2.35	0.41
4:B:85:THR:HA	4:B:317:MET:HE1	2.02	0.41
1:A:128:HIS:C	1:A:128:HIS:ND1	2.79	0.41
4:B:88:VAL:HG21	4:B:317:MET:SD	2.60	0.41
4:B:266:LEU:HD13	4:B:421:VAL:HG11	2.03	0.41
4:B:309:TRP:CG	4:B:445:ASP:HB3	2.55	0.40
5:C:105:THR:HG22	5:C:106:THR:N	2.36	0.40
4:B:612:LYS:O	4:B:616:MET:HG3	2.22	0.40
1:A:326:HIS:O	1:A:327:GLU:HB3	2.20	0.40
2:D:19:MET:HE2	2:D:98:THR:CB	2.50	0.40
1:A:53:PHE:HE2	1:A:63:VAL:HG21	1.85	0.40
1:A:348:ILE:HG23	1:A:354:ILE:HG23	2.03	0.40
5:C:59:ALA:O	5:C:89:VAL:HG12	2.22	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	706/716 (99%)	682 (97%)	23 (3%)	1 (0%)	48 70

Continued on next page...

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
2	D	113/130 (87%)	108 (96%)	5 (4%)	0	100 100
4	B	672/757 (89%)	643 (96%)	29 (4%)	0	100 100
5	C	275/898 (31%)	257 (94%)	18 (6%)	0	100 100
All	All	1766/2501 (71%)	1690 (96%)	75 (4%)	1 (0%)	49 70

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	327	GLU

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A	636/641 (99%)	628 (99%)	8 (1%)	61 82
2	D	107/120 (89%)	102 (95%)	5 (5%)	23 48
4	B	603/670 (90%)	593 (98%)	10 (2%)	53 78
5	C	252/782 (32%)	246 (98%)	6 (2%)	43 70
All	All	1598/2213 (72%)	1569 (98%)	29 (2%)	51 76

All (29) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	118	ILE
1	A	258	GLU
1	A	357	THR
1	A	441	MET
1	A	499	ASN
1	A	513	ASN
1	A	543	LEU
1	A	573	ILE
2	D	9	PHE
2	D	23	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
2	D	34	GLN
2	D	64	LYS
2	D	115	THR
4	B	25	THR
4	B	124	GLN
4	B	241	ILE
4	B	291	THR
4	B	305	ASP
4	B	322	ILE
4	B	350	ARG
4	B	511	SER
4	B	745	LYS
4	B	752	GLU
5	C	16	THR
5	C	18	GLU
5	C	73	GLN
5	C	147	THR
5	C	210	GLU
5	C	224	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	115	ASN
1	A	326	HIS
1	A	499	ASN
1	A	513	ASN
1	A	591	GLN
2	D	101	GLN
4	B	99	HIS
4	B	153	ASN
4	B	306	ASN
4	B	367	GLN
4	B	456	HIS
4	B	567	GLN
4	B	621	GLN
5	C	127	HIS

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
3	E	5/15 (33%)	2 (40%)	0

All (2) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	E	10	C
3	E	14	U

There are no RNA pucker outliers to report.

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.

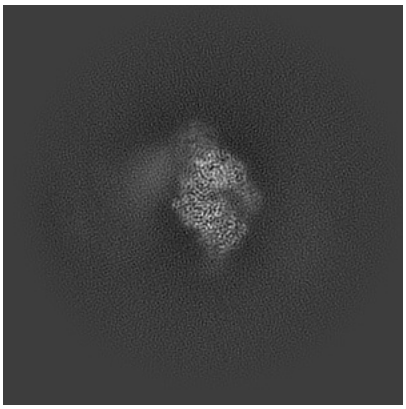
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-59067. These allow visual inspection of the internal detail of the map and identification of artifacts.

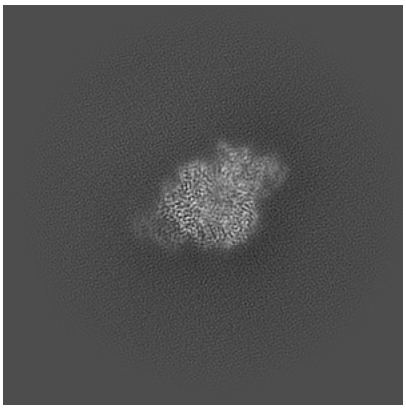
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

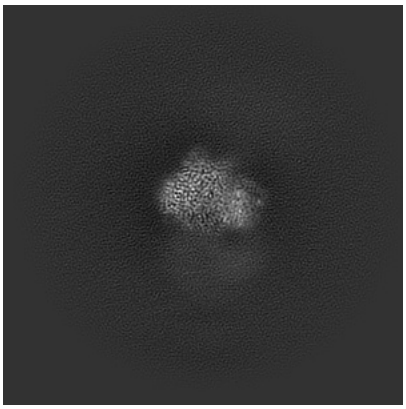
6.1.1 Primary map



X

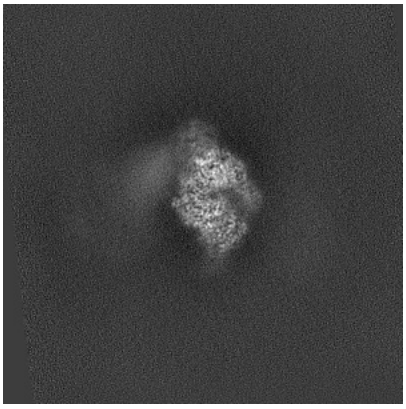


Y

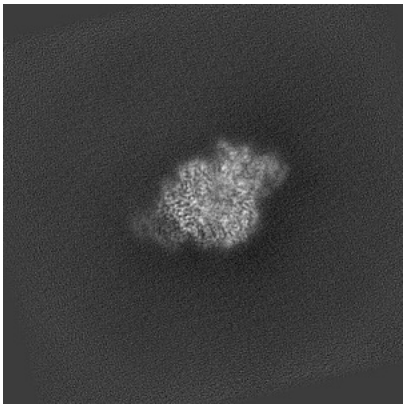


Z

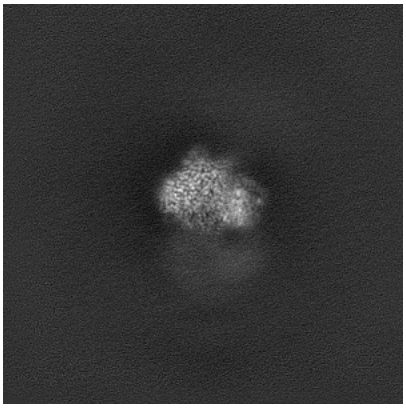
6.1.2 Raw map



X



Y

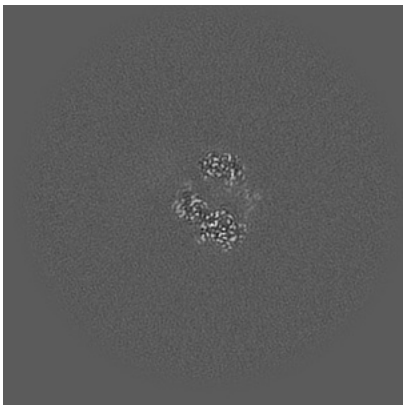


Z

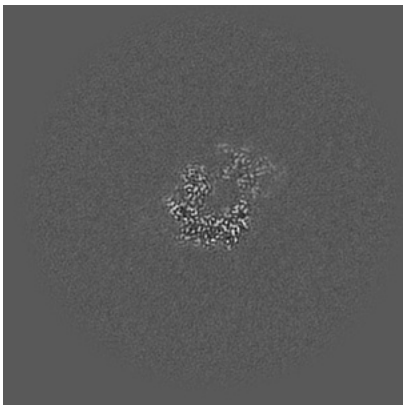
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

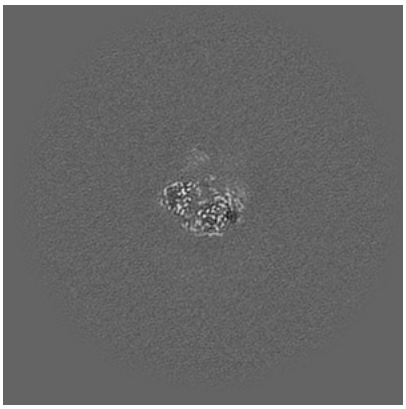
6.2.1 Primary map



X Index: 200

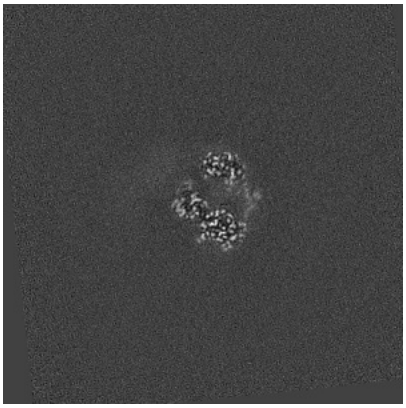


Y Index: 200

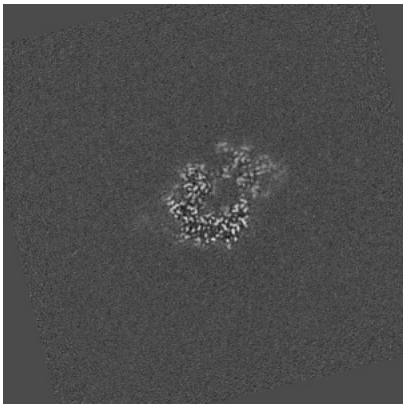


Z Index: 200

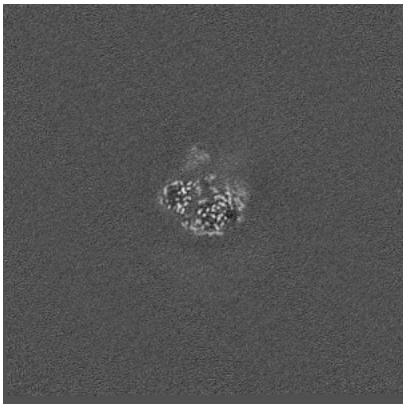
6.2.2 Raw map



X Index: 200



Y Index: 200

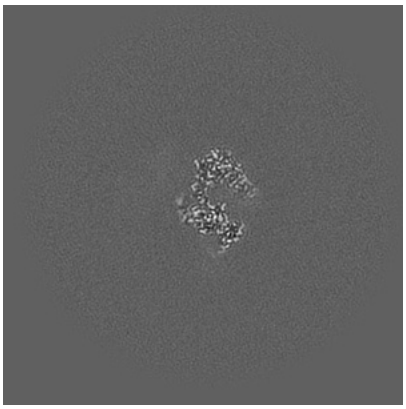


Z Index: 200

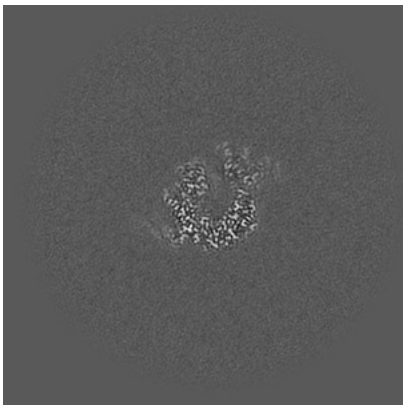
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

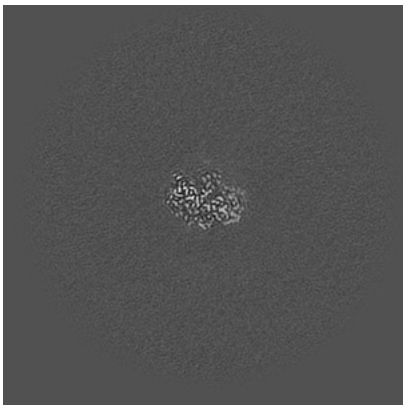
6.3.1 Primary map



X Index: 187

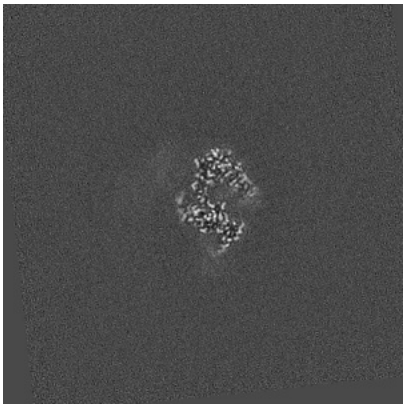


Y Index: 205

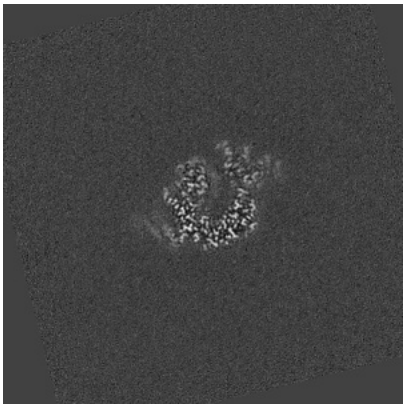


Z Index: 189

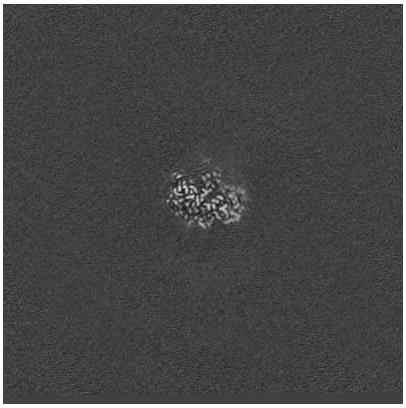
6.3.2 Raw map



X Index: 187



Y Index: 205

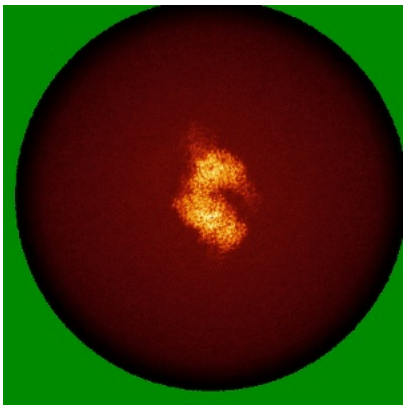


Z Index: 189

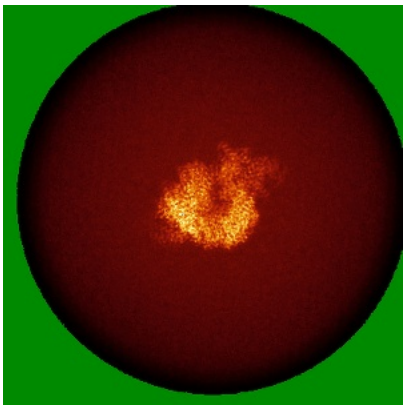
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) (i)

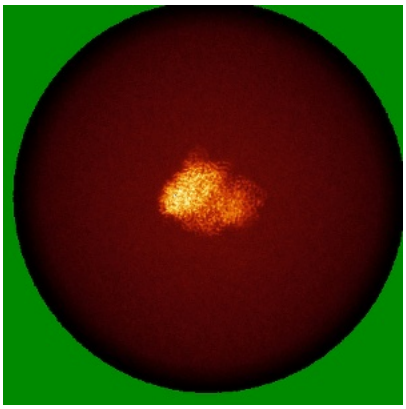
6.4.1 Primary map



X

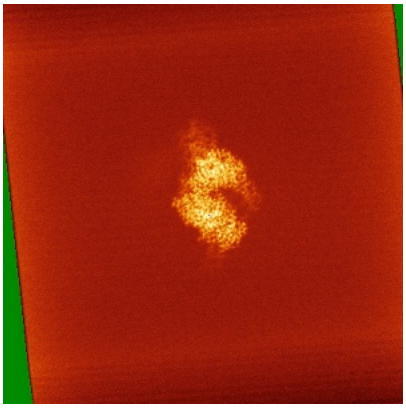


Y

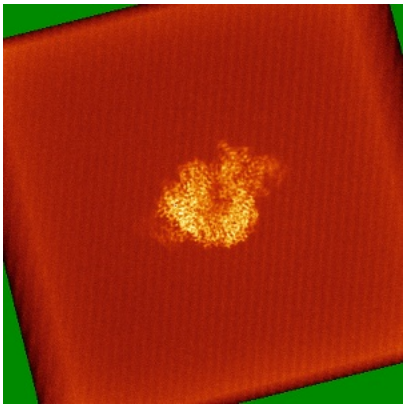


Z

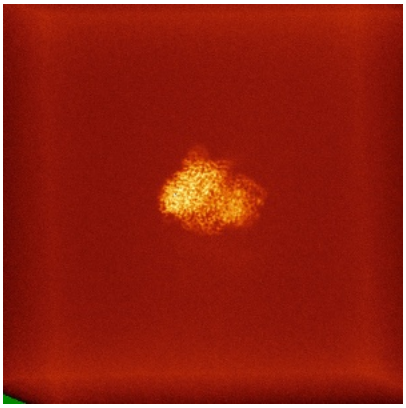
6.4.2 Raw map



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 0.1. 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.

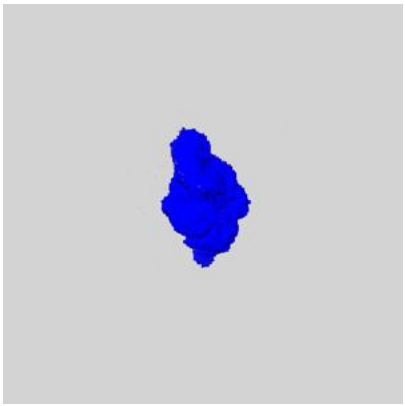
6.6 Mask visualisation (i)

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

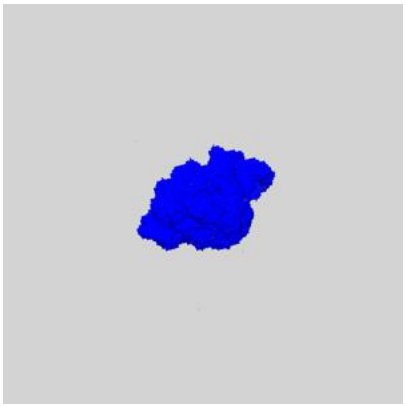
A mask typically either:

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

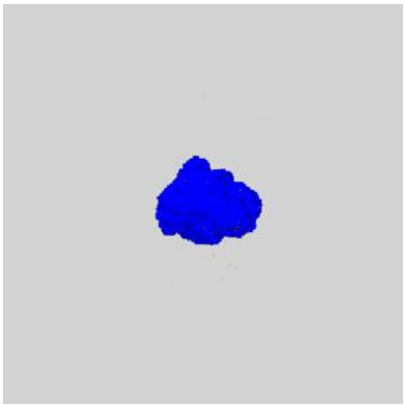
6.6.1 emd_59067_msk_1.map (i)



X



Y

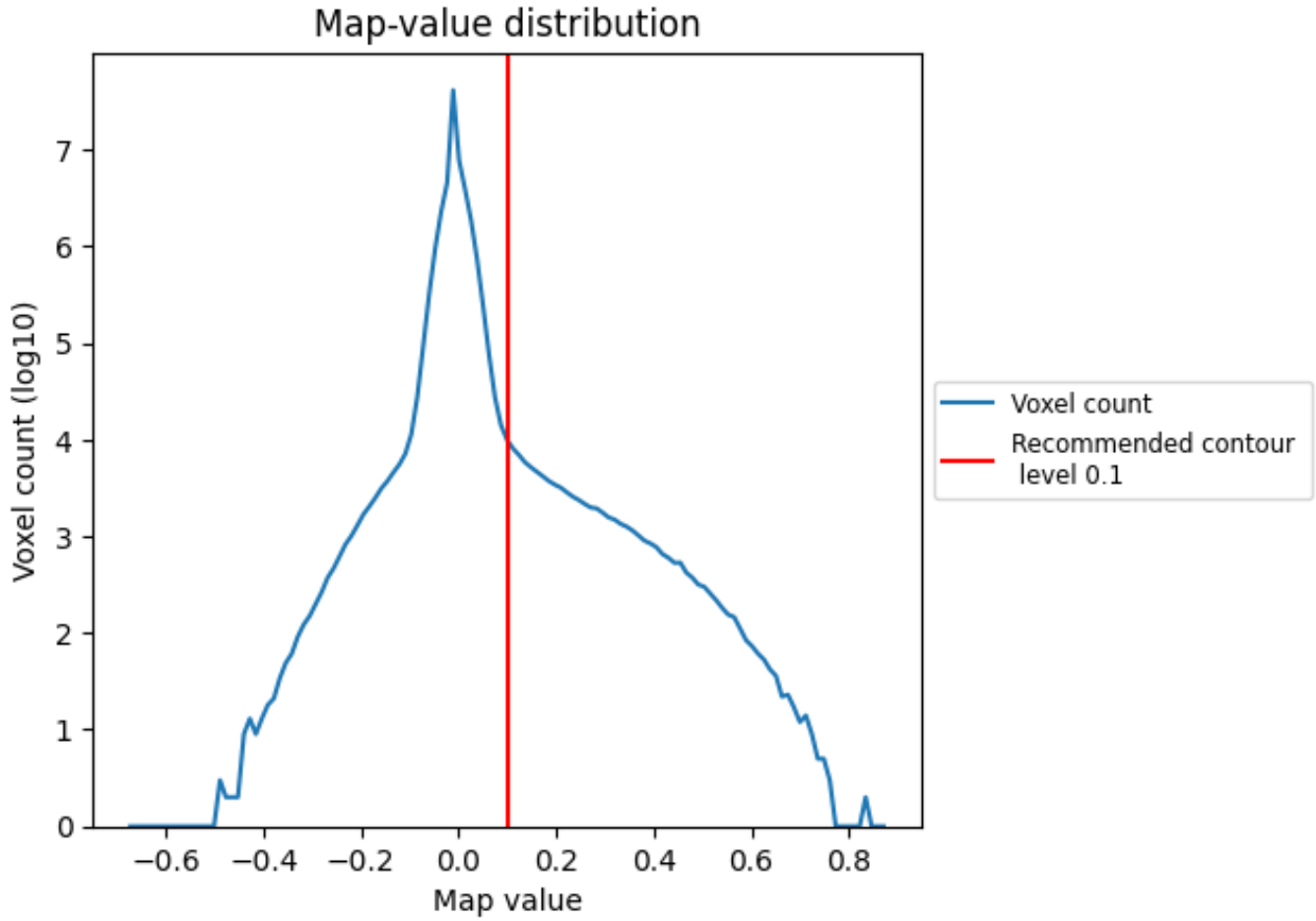


Z

7 Map analysis

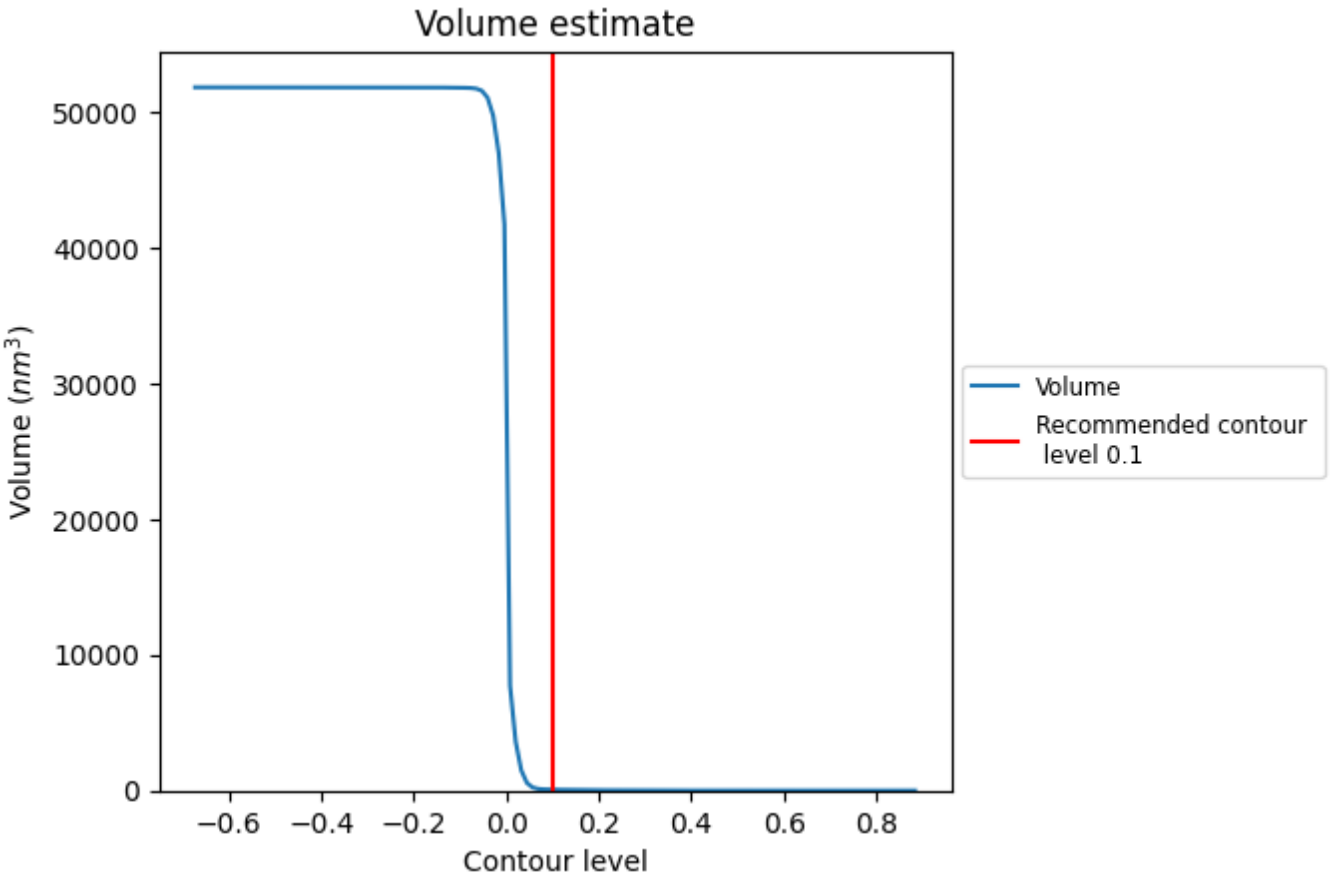
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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.

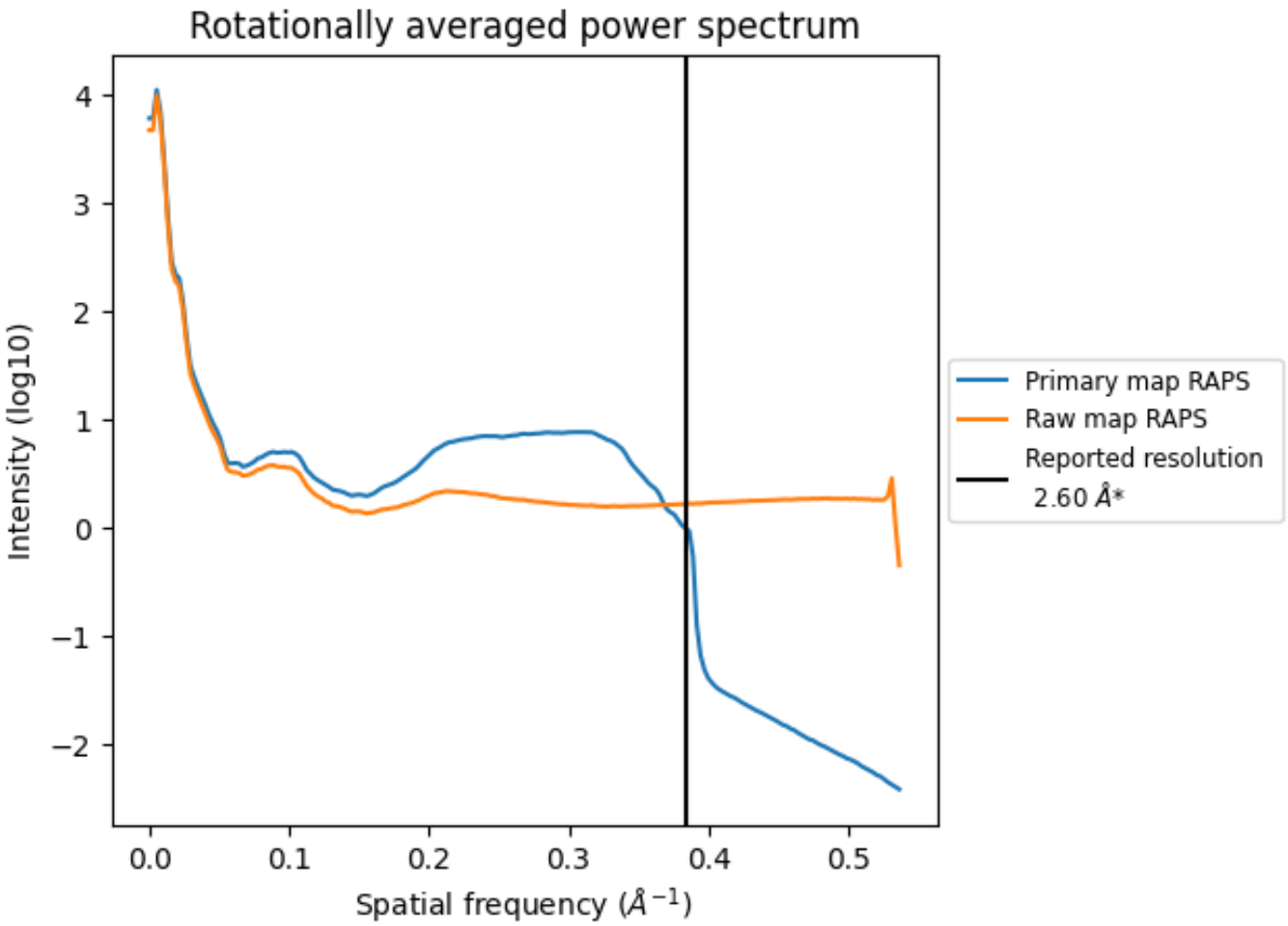
7.2 Volume estimate (i)



The volume at the recommended contour level is 70 nm^3; this corresponds to an approximate mass of 63 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 (i)

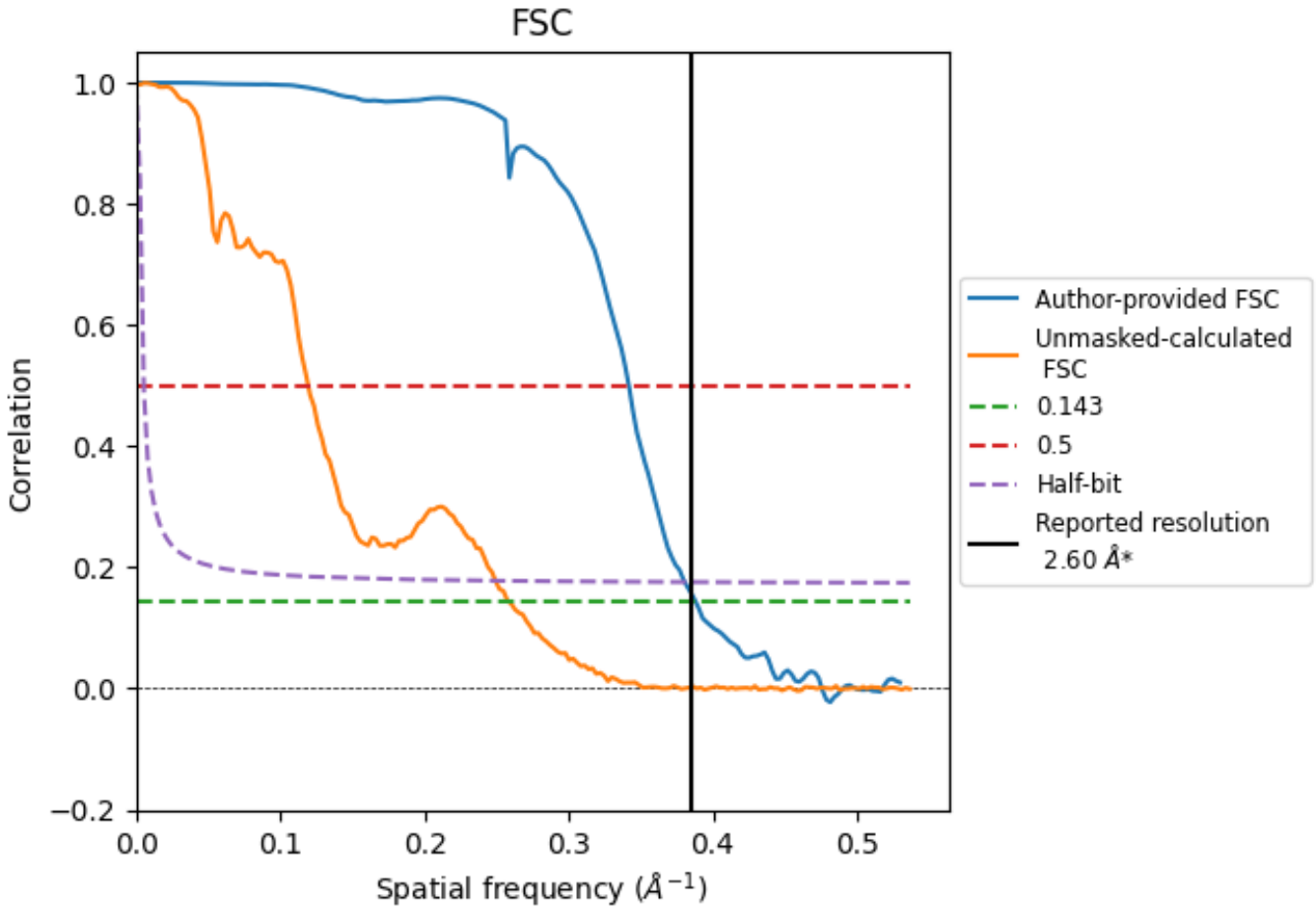


*Reported resolution corresponds to spatial frequency of 0.385 $Å^{-1}$

8 Fourier-Shell correlation

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



*Reported resolution corresponds to spatial frequency of 0.385 Å^{-1}

8.2 Resolution estimates (i)

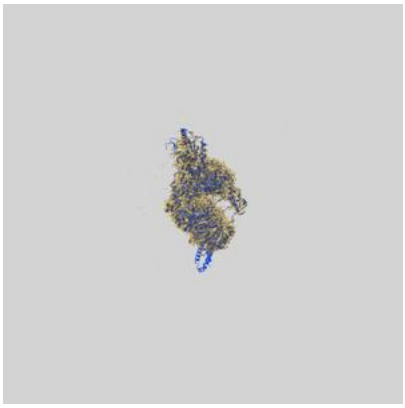
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.60	-	-
Author-provided FSC curve	2.58	2.93	2.63
Unmasked-calculated*	3.87	8.38	4.01

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.87 differs from the reported value 2.6 by more than 10 %

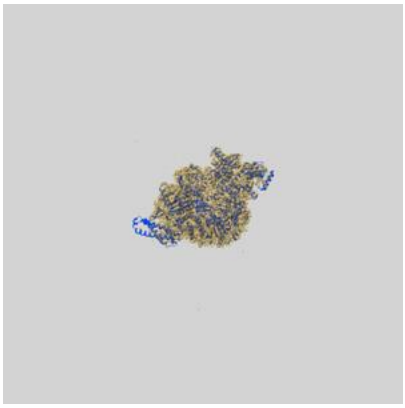
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-59067 and PDB model 32QC. Per-residue inclusion information can be found in section 3 on page 7.

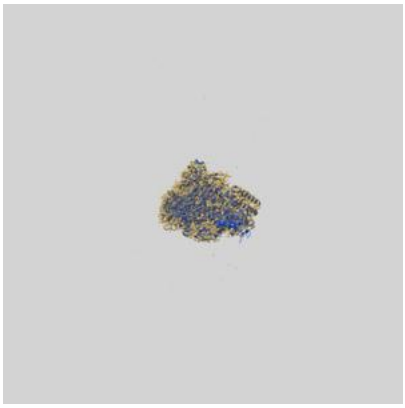
9.1 Map-model overlay



X



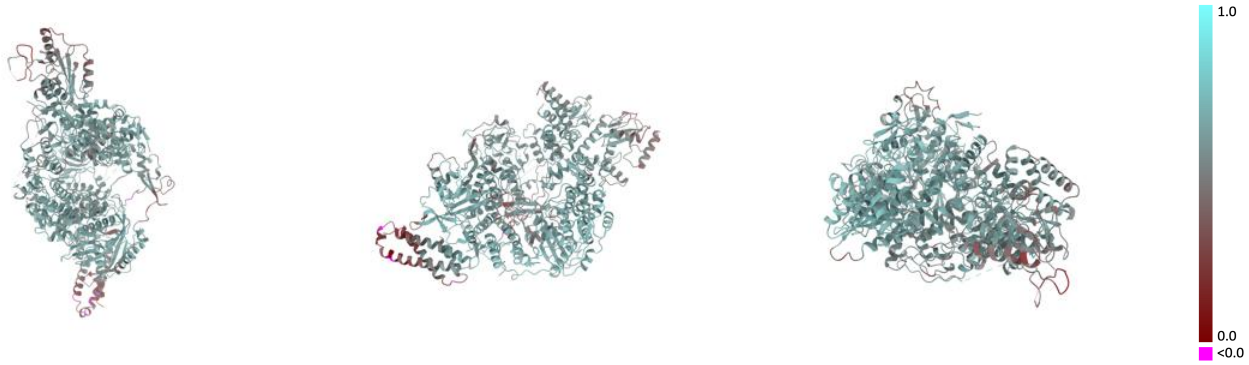
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.1 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.

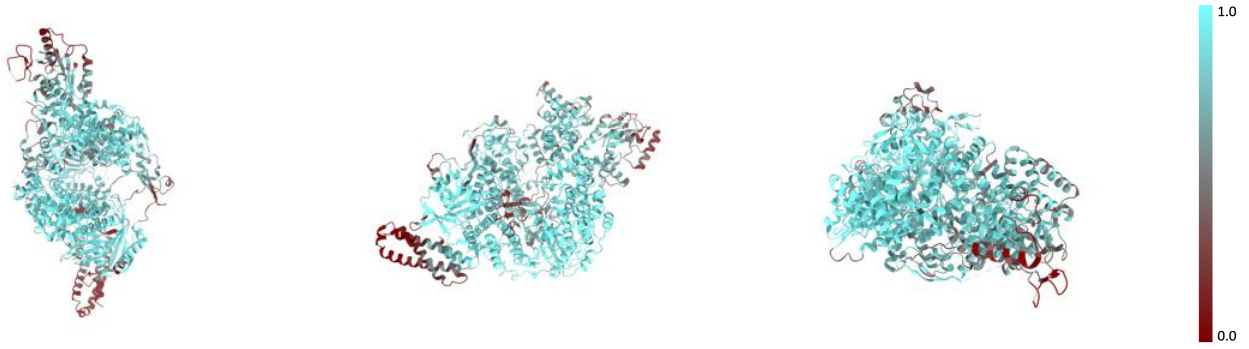
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

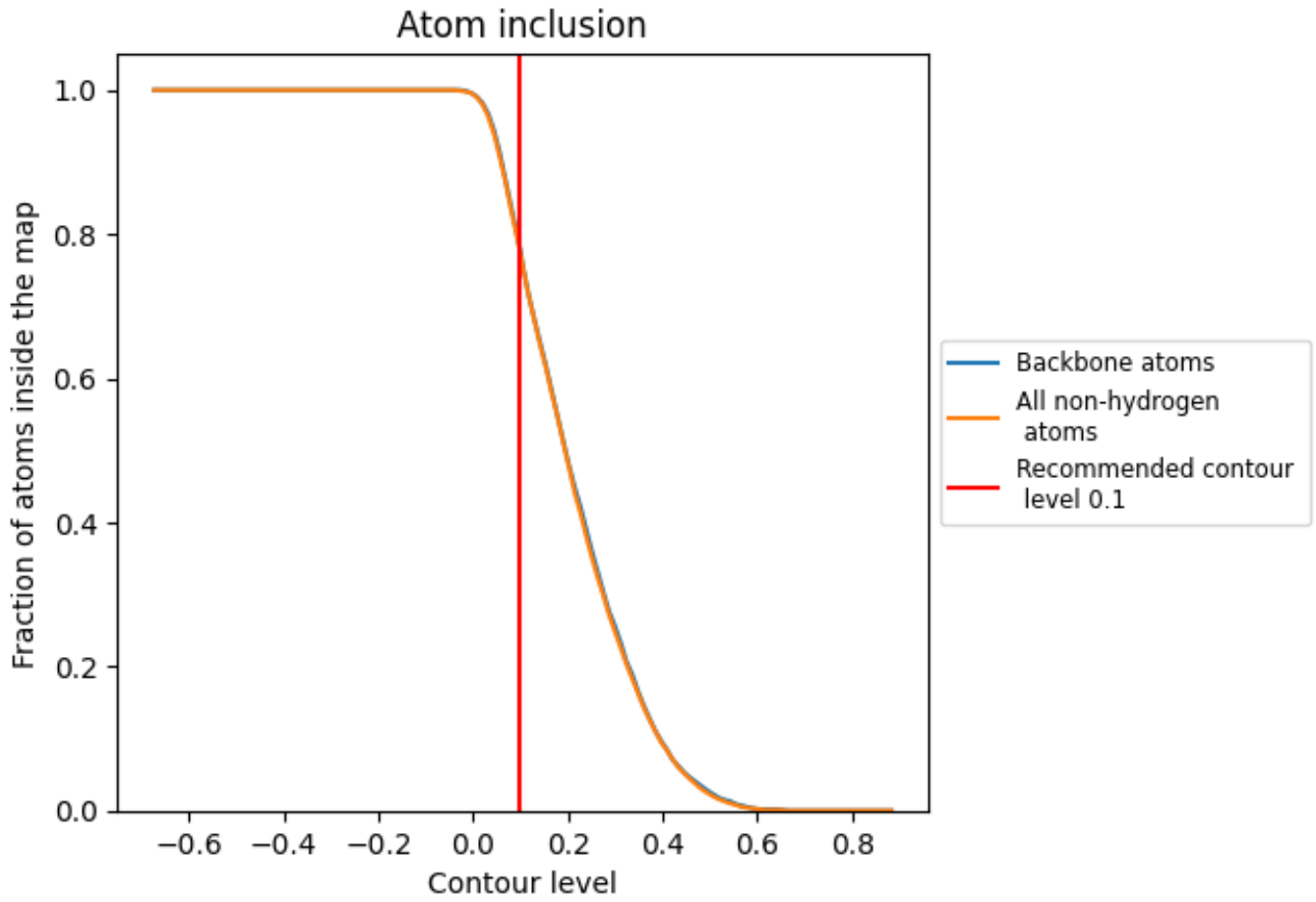
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

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 (0.1).

9.4 Atom inclusion (i)



At the recommended contour level, 78% of all backbone atoms, 78% 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 (0.1) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7750	0.5840
A	0.7810	0.5870
B	0.8810	0.6210
C	0.7290	0.5710
D	0.3160	0.4000
E	0.6470	0.5380

