Full wwPDB EM Validation Report

Oct 13, 2024 – 01:32 am BST

PDB ID	:	8PM0
EMDB ID	:	EMD-17755
Title	:	Influenza A/H7N9 polymerase in replicase-like conformation in pre-initiation state with Pol II pS5 CTD peptide mimic bound in site 1A/2A
Authors	:	Arragain, B.; Cusack, S.
Deposited on	:	2023-06-27
Resolution	:	2.90 Å(reported)
Based on initial model	:	7QTL

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 (i) 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 (i)) were used in the production of this report:

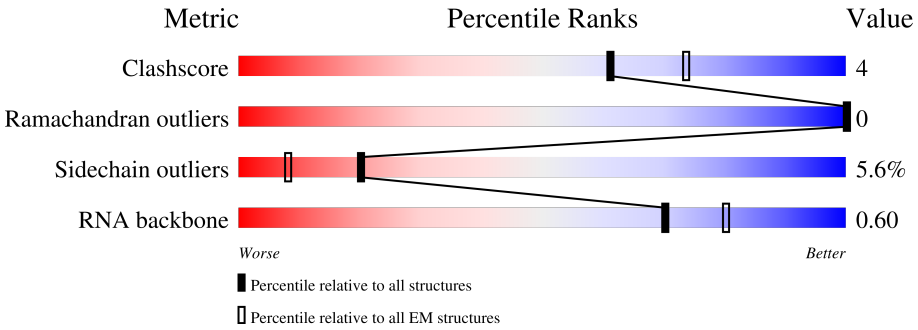
EMDB validation analysis	:	0.0.1.dev113
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.39

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 2.90 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)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

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	729	29% 86% 10%
2	B	757	5% 84% 13%
3	C	788	19% 56% 11% 32%
4	V	51	12% 39% 16% 6% 39%
5	G	42	14% 14% 83%
5	P	42	17% 19% 79%

2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 16669 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 Polymerase acidic protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	708	5748	3641	976	1090	41	0	0

There are 15 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-12	MET	-	initiating methionine	UNP M9TI86
A	-11	HIS	-	expression tag	UNP M9TI86
A	-10	HIS	-	expression tag	UNP M9TI86
A	-9	HIS	-	expression tag	UNP M9TI86
A	-8	HIS	-	expression tag	UNP M9TI86
A	-7	HIS	-	expression tag	UNP M9TI86
A	-6	HIS	-	expression tag	UNP M9TI86
A	-5	HIS	-	expression tag	UNP M9TI86
A	-4	HIS	-	expression tag	UNP M9TI86
A	-3	GLY	-	expression tag	UNP M9TI86
A	-2	SER	-	expression tag	UNP M9TI86
A	-1	GLY	-	expression tag	UNP M9TI86
A	0	SER	-	expression tag	UNP M9TI86
A	349	LYS	GLU	engineered mutation	UNP M9TI86
A	490	ILE	ARG	engineered mutation	UNP M9TI86

- Molecule 2 is a protein called RNA-directed RNA polymerase catalytic subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	735	5850	3678	1023	1103	46	0	0

- Molecule 3 is a protein called Polymerase basic protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	537	4283	2678	777	795	33	0	0

There are 30 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	74	ARG	GLY	engineered mutation	UNP X5F427
C	760	GLY	-	expression tag	UNP X5F427
C	761	TRP	-	expression tag	UNP X5F427
C	762	SER	-	expression tag	UNP X5F427
C	763	HIS	-	expression tag	UNP X5F427
C	764	PRO	-	expression tag	UNP X5F427
C	765	GLN	-	expression tag	UNP X5F427
C	766	PHE	-	expression tag	UNP X5F427
C	767	GLU	-	expression tag	UNP X5F427
C	768	LYS	-	expression tag	UNP X5F427
C	769	GLY	-	expression tag	UNP X5F427
C	770	GLY	-	expression tag	UNP X5F427
C	771	GLY	-	expression tag	UNP X5F427
C	772	SER	-	expression tag	UNP X5F427
C	773	GLY	-	expression tag	UNP X5F427
C	774	GLY	-	expression tag	UNP X5F427
C	775	GLY	-	expression tag	UNP X5F427
C	776	SER	-	expression tag	UNP X5F427
C	777	GLY	-	expression tag	UNP X5F427
C	778	GLY	-	expression tag	UNP X5F427
C	779	SER	-	expression tag	UNP X5F427
C	780	ALA	-	expression tag	UNP X5F427
C	781	TRP	-	expression tag	UNP X5F427
C	782	SER	-	expression tag	UNP X5F427
C	783	HIS	-	expression tag	UNP X5F427
C	784	PRO	-	expression tag	UNP X5F427
C	785	GLN	-	expression tag	UNP X5F427
C	786	PHE	-	expression tag	UNP X5F427
C	787	GLU	-	expression tag	UNP X5F427
C	788	LYS	-	expression tag	UNP X5F427

- Molecule 4 is a RNA chain called 51-mer vRNA loop (v51_mut_S).

Mol	Chain	Residues	Atoms					AltConf	Trace
4	V	31	Total	C	N	O	P	0	0
			659	294	114	220	31		

- Molecule 5 is a protein called RNA Pol II CTD 6 repeats (site 1A/2A).

Mol	Chain	Residues	Atoms					AltConf	Trace
5	P	9	Total	C	N	O	P	0	0
			73	44	9	19	1		
5	G	7	Total	C	N	O	P	0	0
			55	32	7	15	1		

- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

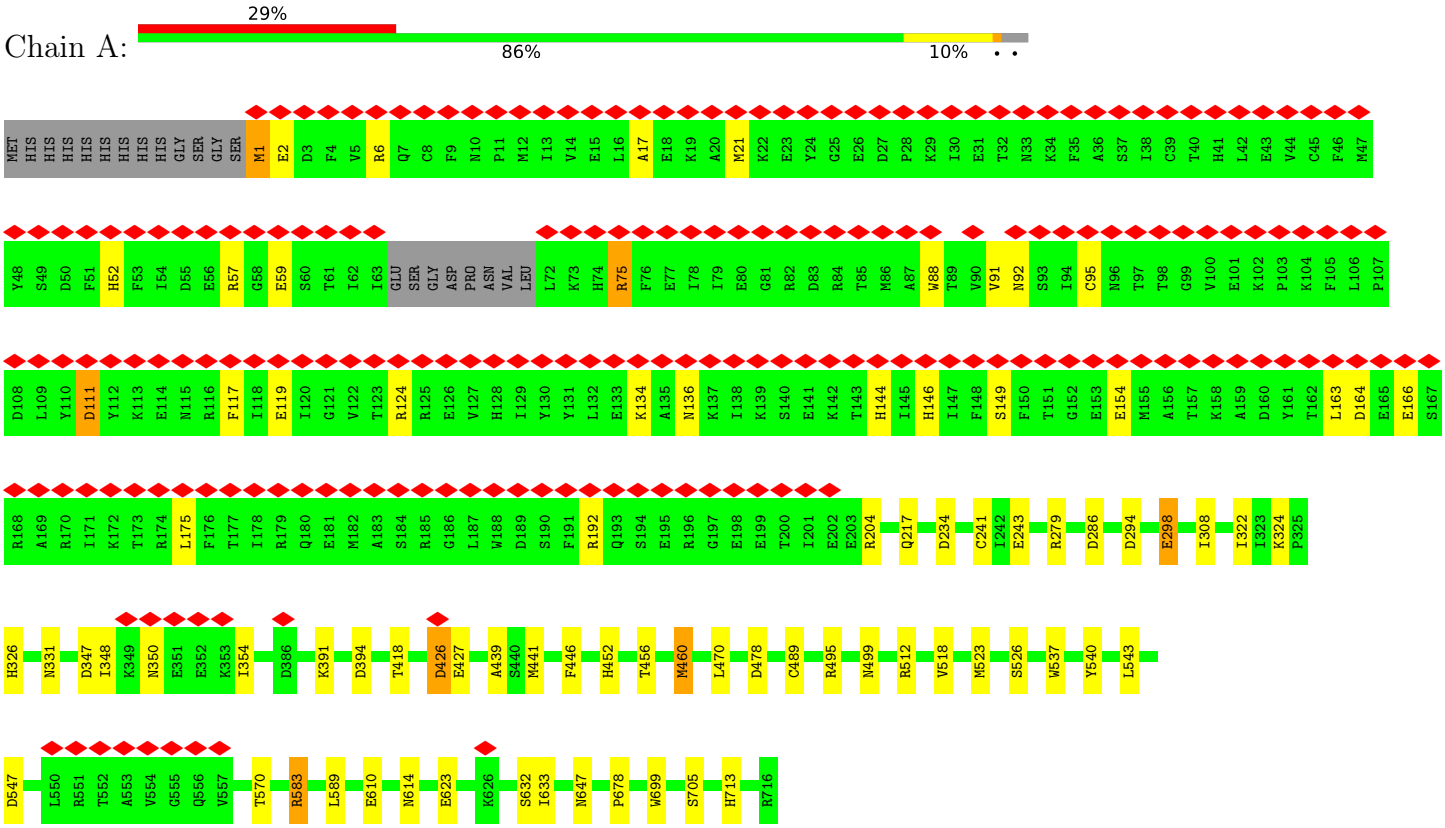
Mol	Chain	Residues	Atoms		AltConf
6	B	1	Total	Mg	0
			1	1	

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.

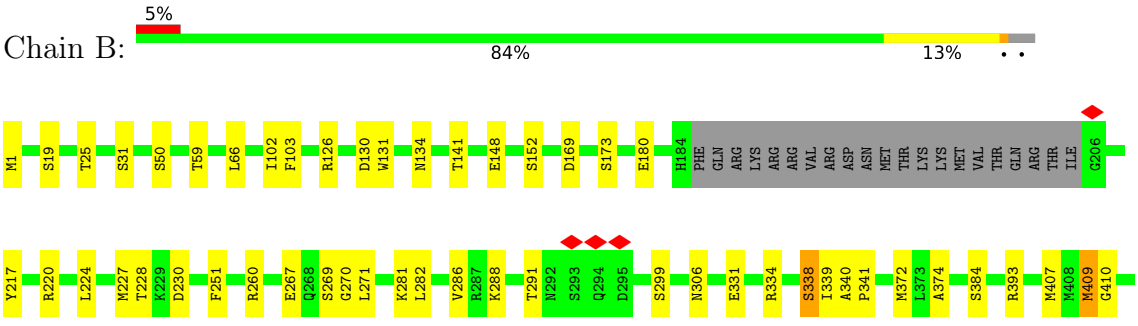
• Molecule 1: Polymerase acidic protein

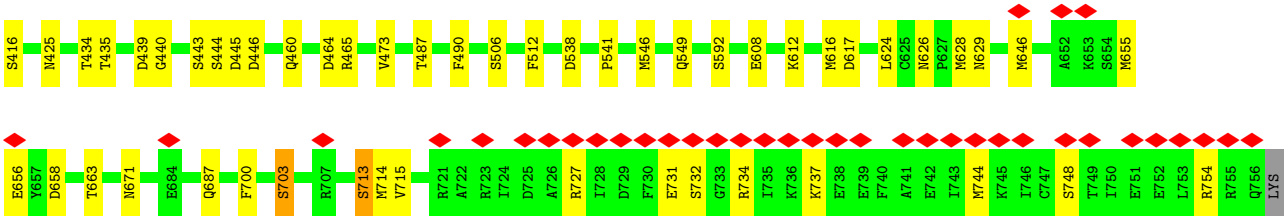
Chain A:



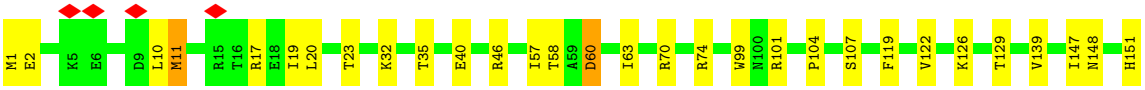
• Molecule 2: RNA-directed RNA polymerase catalytic subunit

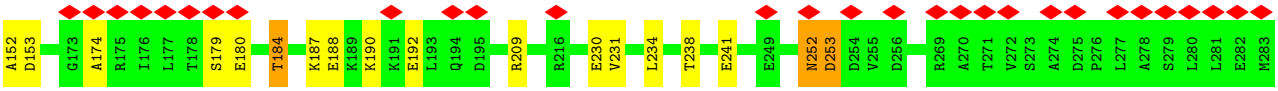
Chain B:

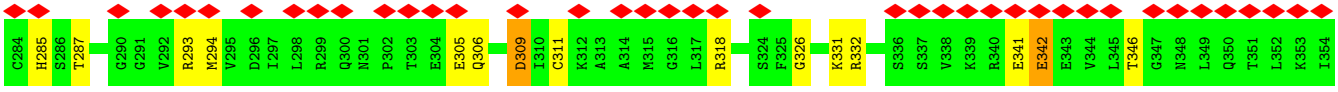


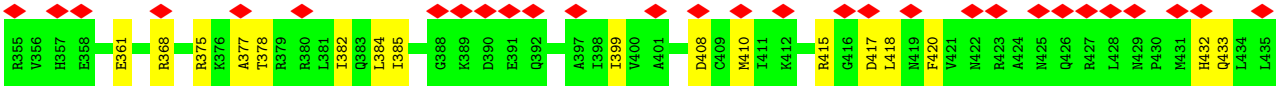


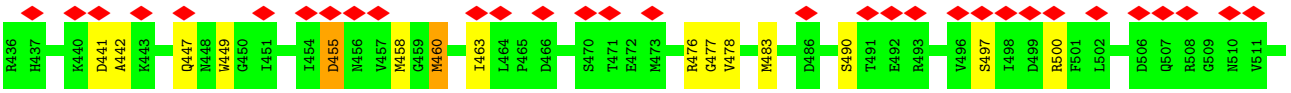
• Molecule 3: Polymerase basic protein 2

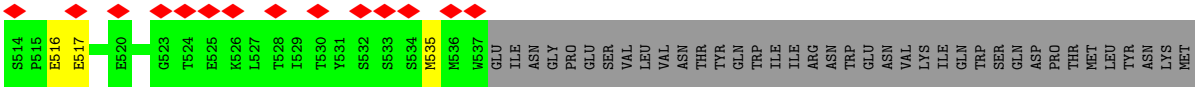


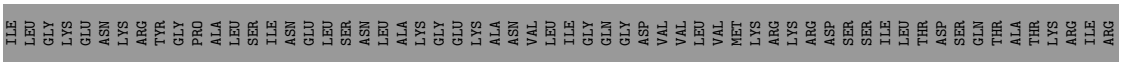


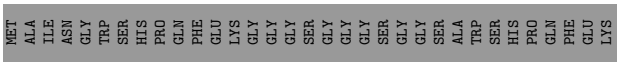




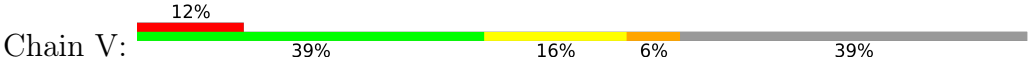




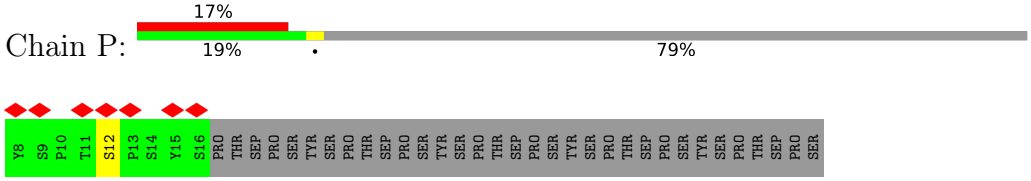




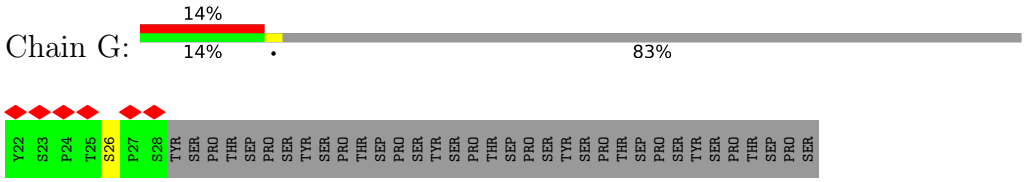
• Molecule 4: 51-mer vRNA loop (v51_mut_S)



• Molecule 5: RNA Pol II CTD 6 repeats (site 1A/2A)



• Molecule 5: RNA Pol II CTD 6 repeats (site 1A/2A)



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	33395	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 ($e^-/Å^2$)	40	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.061	Depositor
Minimum map value	-0.029	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.01	Depositor
Map size (Å)	302.4, 302.4, 302.4	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.84, 0.84, 0.84	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, MG

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	0.26	0/5870	0.48	0/7911
2	B	0.26	0/5965	0.50	0/8046
3	C	0.25	0/4351	0.53	0/5862
4	V	0.48	1/734 (0.1%)	0.68	0/1137
5	G	0.24	0/46	0.35	0/61
5	P	0.27	0/65	0.37	0/87
All	All	0.27	1/17031 (0.0%)	0.51	0/23104

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	V	1	A	OP3-P	-10.76	1.48	1.61

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	5748	0	5689	40	0
2	B	5850	0	5828	56	0
3	C	4283	0	4379	58	0
4	V	659	0	334	7	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	G	55	0	42	0	0
5	P	73	0	56	0	0
6	B	1	0	0	0	0
All	All	16669	0	16328	140	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 (140) 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)
3:C:11:MET:O	3:C:17:ARG:NH1	2.05	0.89
2:B:409:MET:O	4:V:49:G:N2	2.08	0.85
2:B:700:PHE:O	2:B:703:SER:OG	2.00	0.80
2:B:334:ARG:O	2:B:338:SER:OG	2.04	0.75
3:C:151:HIS:O	3:C:252:ASN:ND2	2.21	0.73
3:C:10:LEU:HD22	3:C:20:LEU:HD12	1.70	0.73
2:B:267:GLU:OE1	2:B:267:GLU:N	2.18	0.73
2:B:291:THR:HG21	3:C:385:ILE:HD11	1.70	0.71
1:A:243:GLU:N	1:A:243:GLU:OE1	2.18	0.71
1:A:512:ARG:NH2	4:V:42:U:O2	2.25	0.70
2:B:291:THR:HG21	3:C:385:ILE:CD1	2.22	0.69
2:B:306:ASN:ND2	2:B:445:ASP:O	2.27	0.68
1:A:350:ASN:O	1:A:350:ASN:ND2	2.25	0.68
1:A:286:ASP:O	1:A:526:SER:OG	2.10	0.67
1:A:583:ARG:NH2	2:B:512:PHE:O	2.28	0.66
3:C:70:ARG:NH1	3:C:74:ARG:O	2.29	0.64
2:B:658:ASP:OD1	3:C:209:ARG:NH2	2.30	0.64
1:A:88:TRP:O	1:A:92:ASN:ND2	2.31	0.63
1:A:322:ILE:HD13	1:A:543:LEU:HD22	1.79	0.63
1:A:427:GLU:N	1:A:427:GLU:OE1	2.32	0.62
2:B:444:SER:OG	2:B:445:ASP:N	2.33	0.62
1:A:326:HIS:N	1:A:331:ASN:OD1	2.32	0.62
2:B:19:SER:OG	2:B:506:SER:OG	2.07	0.62
1:A:217:GLN:NE2	2:B:59:THR:OG1	2.34	0.61
2:B:173:SER:HG	2:B:217:TYR:HH	1.47	0.61
2:B:286:VAL:HG21	2:B:490:PHE:CE1	2.37	0.60
2:B:374:ALA:O	2:B:393:ARG:NE	2.37	0.58
3:C:326:GLY:N	3:C:517:GLU:OE2	2.36	0.58
2:B:460:GLN:NE2	2:B:464:ASP:OD1	2.34	0.57
2:B:626:ASN:ND2	3:C:104:PRO:O	2.37	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:538:ASP:OD1	3:C:238:THR:OG1	2.21	0.56
2:B:340:ALA:HB3	2:B:341:PRO:HD3	1.87	0.56
3:C:332:ARG:NE	3:C:361:GLU:OE2	2.38	0.56
3:C:180:GLU:O	3:C:184:THR:OG1	2.23	0.55
4:V:5:G:OP2	4:V:5:G:N2	2.28	0.55
2:B:270:GLY:C	2:B:271:LEU:HD23	2.27	0.55
2:B:715:VAL:HG11	3:C:11:MET:CE	2.36	0.55
2:B:727:ARG:NH1	2:B:731:GLU:OE2	2.40	0.55
1:A:117:PHE:O	1:A:144:HIS:N	2.39	0.54
3:C:378:THR:O	3:C:378:THR:HG23	2.08	0.54
2:B:629:ASN:HD22	2:B:663:THR:HG22	1.73	0.54
3:C:341:GLU:OE1	3:C:342:GLU:N	2.40	0.54
3:C:377:ALA:HB2	3:C:382:ILE:HD11	1.89	0.53
1:A:647:ASN:OD1	1:A:699:TRP:NE1	2.34	0.53
3:C:231:VAL:CG2	3:C:234:LEU:HD23	2.39	0.53
1:A:610:GLU:OE1	1:A:614:ASN:ND2	2.42	0.53
3:C:231:VAL:HG22	3:C:234:LEU:HB3	1.90	0.52
4:V:7:A:O2'	4:V:8:A:OP2	2.19	0.52
2:B:130:ASP:O	2:B:134:ASN:N	2.43	0.51
3:C:449:TRP:O	3:C:476:ARG:NH1	2.42	0.51
1:A:17:ALA:O	1:A:21:MET:HG2	2.11	0.51
1:A:324:LYS:NZ	1:A:540:TYR:O	2.39	0.51
2:B:282:LEU:O	2:B:286:VAL:HG23	2.11	0.51
2:B:715:VAL:HG11	3:C:11:MET:HE3	1.92	0.51
3:C:148:ASN:O	3:C:151:HIS:ND1	2.38	0.50
2:B:230:ASP:OD2	4:V:48:U:N3	2.44	0.50
1:A:119:GLU:OE1	1:A:134:LYS:NZ	2.42	0.50
2:B:434:THR:HG22	2:B:435:THR:H	1.77	0.50
2:B:713:SER:OG	2:B:715:VAL:HG22	2.12	0.50
1:A:439:ALA:HB2	2:B:541:PRO:HB2	1.93	0.50
2:B:269:SER:O	2:B:281:LYS:NZ	2.39	0.50
3:C:455:ASP:OD1	3:C:455:ASP:N	2.46	0.49
2:B:732:SER:OG	2:B:734:ARG:NE	2.45	0.49
3:C:19:ILE:O	3:C:23:THR:HG22	2.12	0.48
3:C:147:ILE:CD1	3:C:147:ILE:O	2.61	0.48
3:C:331:LYS:NZ	3:C:490:SER:O	2.47	0.48
2:B:671:ASN:ND2	4:V:45:U:OP2	2.38	0.48
3:C:119:PHE:HA	3:C:122:VAL:HG12	1.95	0.48
3:C:253:ASP:N	3:C:253:ASP:OD1	2.47	0.48
1:A:75:ARG:NE	1:A:111:ASP:OD1	2.47	0.48
3:C:420:PHE:O	3:C:433:GLN:NE2	2.47	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:714:MET:HG3	3:C:23:THR:HG23	1.96	0.47
3:C:139:VAL:O	3:C:139:VAL:HG13	2.13	0.47
1:A:59:GLU:OE1	1:A:59:GLU:N	2.39	0.47
3:C:10:LEU:HD22	3:C:20:LEU:CD1	2.42	0.47
1:A:1:MET:HE2	1:A:1:MET:C	2.35	0.47
2:B:744:MET:HE2	2:B:744:MET:O	2.15	0.47
3:C:306:GLN:OE1	3:C:306:GLN:N	2.44	0.47
3:C:2:GLU:CD	3:C:2:GLU:H	2.18	0.47
1:A:146:HIS:NE2	1:A:154:GLU:OE2	2.48	0.47
1:A:166:GLU:OE1	1:A:166:GLU:N	2.43	0.47
1:A:623:GLU:OE1	1:A:713:HIS:NE2	2.48	0.47
2:B:271:LEU:HD21	2:B:443:SER:OG	2.15	0.47
3:C:385:ILE:HD12	3:C:460:MET:CE	2.45	0.46
2:B:251:PHE:CE1	2:B:339:ILE:HG21	2.51	0.46
2:B:286:VAL:HG21	2:B:490:PHE:HE1	1.81	0.46
3:C:10:LEU:CD2	3:C:20:LEU:HD12	2.41	0.46
1:A:322:ILE:HD13	1:A:543:LEU:CD2	2.44	0.46
2:B:612:LYS:O	2:B:616:MET:HG3	2.16	0.46
3:C:463:ILE:HD11	3:C:478:VAL:HG11	1.96	0.46
3:C:417:ASP:OD1	3:C:418:LEU:N	2.49	0.46
1:A:308:ILE:HD11	1:A:348:ILE:CG2	2.46	0.46
3:C:399:ILE:HD11	3:C:442:ALA:CB	2.45	0.46
3:C:188:GLU:O	3:C:192:GLU:HG3	2.15	0.46
3:C:408:ASP:OD1	3:C:408:ASP:C	2.53	0.46
2:B:251:PHE:HB3	2:B:340:ALA:HB2	1.97	0.46
3:C:432:HIS:ND1	3:C:516:GLU:OE2	2.50	0.45
3:C:231:VAL:HG21	3:C:234:LEU:HD23	1.99	0.45
1:A:88:TRP:CE2	3:C:174:ALA:HB2	2.51	0.45
2:B:434:THR:HG22	2:B:435:THR:N	2.31	0.45
3:C:57:ILE:HG22	3:C:58:THR:N	2.32	0.45
2:B:102:ILE:HG23	2:B:103:PHE:N	2.32	0.45
2:B:141:THR:OG1	3:C:35:THR:O	2.34	0.45
3:C:384:LEU:N	3:C:477:GLY:O	2.50	0.45
2:B:224:LEU:HD11	2:B:409:MET:HE3	2.00	0.44
1:A:446:PHE:HB3	1:A:589:LEU:HD22	1.99	0.44
1:A:632:SER:OG	1:A:633:ILE:N	2.50	0.44
1:A:52:HIS:CD2	1:A:163:LEU:HD11	2.52	0.44
2:B:288:LYS:HG3	3:C:375:ARG:HD2	2.00	0.44
3:C:152:ALA:O	3:C:153:ASP:OD1	2.36	0.44
2:B:439:ASP:OD1	2:B:440:GLY:N	2.49	0.43
1:A:1:MET:HE2	1:A:2:GLU:N	2.33	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:663:THR:HG21	3:C:99:TRP:CD1	2.53	0.43
3:C:309:ASP:N	3:C:309:ASP:OD1	2.51	0.43
1:A:88:TRP:HA	1:A:91:VAL:HG12	2.00	0.43
1:A:456:THR:HG22	1:A:460:MET:HE2	2.01	0.43
2:B:407:MET:O	2:B:410:GLY:N	2.52	0.43
2:B:50:SER:O	2:B:66:LEU:HD21	2.18	0.42
2:B:617:ASP:N	2:B:617:ASP:OD1	2.53	0.42
3:C:287:THR:HG23	3:C:294:MET:HB3	2.00	0.42
2:B:131:TRP:O	2:B:220:ARG:NH1	2.52	0.42
1:A:426:ASP:O	2:B:549:GLN:NE2	2.50	0.42
3:C:60:ASP:O	3:C:63:ILE:HG22	2.20	0.42
1:A:298:GLU:CD	1:A:298:GLU:H	2.23	0.41
3:C:463:ILE:HD11	3:C:478:VAL:CG1	2.50	0.41
2:B:629:ASN:ND2	2:B:663:THR:HG22	2.36	0.41
3:C:385:ILE:HG23	3:C:460:MET:CE	2.50	0.41
2:B:299:SER:OG	2:B:487:THR:HG21	2.20	0.41
3:C:40:GLU:OE2	3:C:46:ARG:NE	2.47	0.41
3:C:305:GLU:O	3:C:309:ASP:OD1	2.37	0.41
1:A:354:ILE:O	1:A:354:ILE:HG22	2.21	0.41
1:A:149:SER:O	1:A:175:LEU:HD23	2.21	0.41
2:B:31:SER:CB	2:B:228:THR:HG21	2.51	0.41
1:A:294:ASP:OD1	1:A:294:ASP:C	2.59	0.41
1:A:418:THR:N	1:A:452:HIS:O	2.42	0.41
3:C:10:LEU:C	3:C:10:LEU:HD23	2.41	0.41
2:B:291:THR:HG21	3:C:385:ILE:HD12	2.03	0.40
4:V:16:G:H22	4:V:37:U:H3	1.69	0.40
1:A:324:LYS:NZ	1:A:537:TRP:O	2.44	0.40
1:A:518:VAL:HG12	1:A:570:THR:O	2.21	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	704/729 (97%)	686 (97%)	18 (3%)	0	100	100
2	B	731/757 (97%)	715 (98%)	16 (2%)	0	100	100
3	C	535/788 (68%)	524 (98%)	11 (2%)	0	100	100
5	G	4/42 (10%)	4 (100%)	0	0	100	100
5	P	6/42 (14%)	5 (83%)	1 (17%)	0	100	100
All	All	1980/2358 (84%)	1934 (98%)	46 (2%)	0	100	100

There are no Ramachandran outliers to report.

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	638/656 (97%)	607 (95%)	31 (5%)	21	53
2	B	645/668 (97%)	612 (95%)	33 (5%)	20	51
3	C	477/686 (70%)	442 (93%)	35 (7%)	11	34
5	G	6/36 (17%)	6 (100%)	0	100	100
5	P	8/36 (22%)	8 (100%)	0	100	100
All	All	1774/2082 (85%)	1675 (94%)	99 (6%)	20	47

All (99) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	1	MET
1	A	6	ARG
1	A	57	ARG
1	A	75	ARG
1	A	95	CYS
1	A	111	ASP
1	A	124	ARG
1	A	136	ASN
1	A	164	ASP
1	A	192	ARG

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Mol	Chain	Res	Type
1	A	204	ARG
1	A	234	ASP
1	A	241	CYS
1	A	279	ARG
1	A	298	GLU
1	A	347	ASP
1	A	391	LYS
1	A	394	ASP
1	A	426	ASP
1	A	441	MET
1	A	460	MET
1	A	470	LEU
1	A	478	ASP
1	A	489	CYS
1	A	495	ARG
1	A	499	ASN
1	A	523	MET
1	A	547	ASP
1	A	583	ARG
1	A	678	PRO
1	A	705	SER
2	B	1	MET
2	B	25	THR
2	B	126	ARG
2	B	148	GLU
2	B	152	SER
2	B	169	ASP
2	B	180	GLU
2	B	227	MET
2	B	260	ARG
2	B	331	GLU
2	B	338	SER
2	B	372	MET
2	B	384	SER
2	B	409	MET
2	B	416	SER
2	B	425	ASN
2	B	446	ASP
2	B	465	ARG
2	B	473	VAL
2	B	546	MET
2	B	592	SER

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Mol	Chain	Res	Type
2	B	608	GLU
2	B	624	LEU
2	B	628	MET
2	B	646	MET
2	B	655	MET
2	B	656	GLU
2	B	687	GLN
2	B	703	SER
2	B	713	SER
2	B	737	LYS
2	B	748	SER
2	B	754	ARG
3	C	1	MET
3	C	11	MET
3	C	32	LYS
3	C	60	ASP
3	C	101	ARG
3	C	107	SER
3	C	126	LYS
3	C	129	THR
3	C	179	SER
3	C	184	THR
3	C	187	LYS
3	C	190	LYS
3	C	230	GLU
3	C	241	GLU
3	C	252	ASN
3	C	253	ASP
3	C	285	HIS
3	C	293	ARG
3	C	309	ASP
3	C	311	CYS
3	C	318	ARG
3	C	342	GLU
3	C	346	THR
3	C	368	ARG
3	C	410	MET
3	C	415	ARG
3	C	441	ASP
3	C	447	GLN
3	C	455	ASP
3	C	458	MET

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Mol	Chain	Res	Type
3	C	460	MET
3	C	483	MET
3	C	497	SER
3	C	500	ARG
3	C	535	MET

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
4	V	29/51 (56%)	4 (13%)	0

All (4) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
4	V	7	A
4	V	8	A
4	V	11	A
4	V	48	U

There are no RNA pucker outliers to report.

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

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	$\#\|Z\| > 2$
5	SEP	G	26	5	8,9,10	1.53	1 (12%)	8,12,14	1.47	2 (25%)
5	SEP	P	12	5	8,9,10	1.54	1 (12%)	8,12,14	1.45	2 (25%)

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
5	SEP	G	26	5	-	1/5/8/10	-
5	SEP	P	12	5	-	0/5/8/10	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	P	12	SEP	P-O1P	3.37	1.61	1.50
5	G	26	SEP	P-O1P	3.34	1.61	1.50

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	G	26	SEP	P-OG-CB	-2.66	110.97	118.30
5	P	12	SEP	P-OG-CB	-2.64	111.03	118.30
5	G	26	SEP	OG-CB-CA	2.62	110.70	108.14
5	P	12	SEP	OG-CB-CA	2.51	110.59	108.14

There are no chirality outliers.

All (1) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	G	26	SEP	N-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)

Of 1 ligands modelled in this entry, 1 is monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.

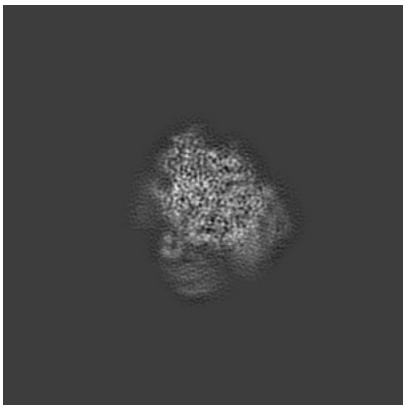
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-17755. These allow visual inspection of the internal detail of the map and identification of artifacts.

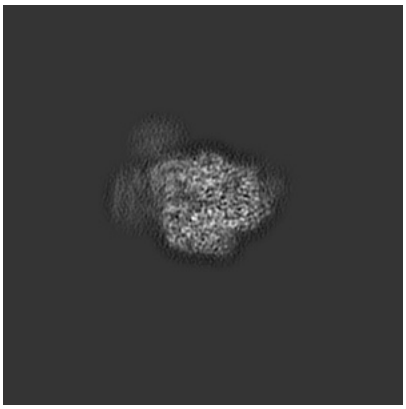
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

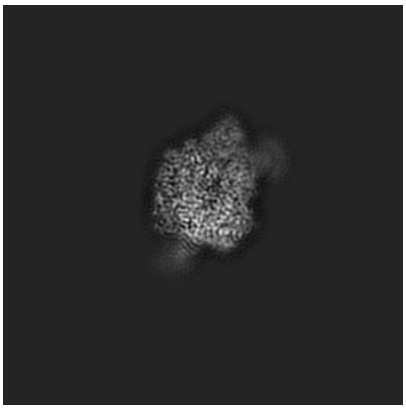
6.1.1 Primary map



X

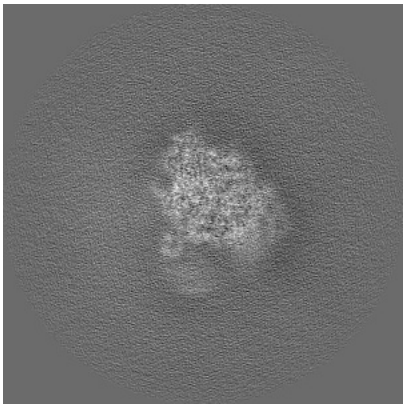


Y

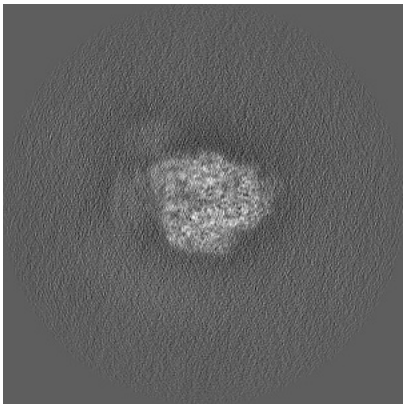


Z

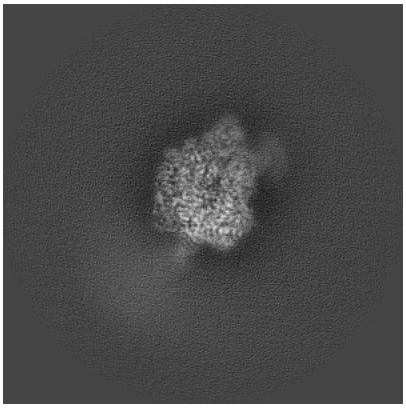
6.1.2 Raw map



X



Y

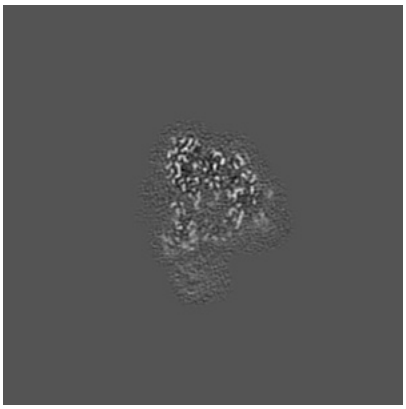


Z

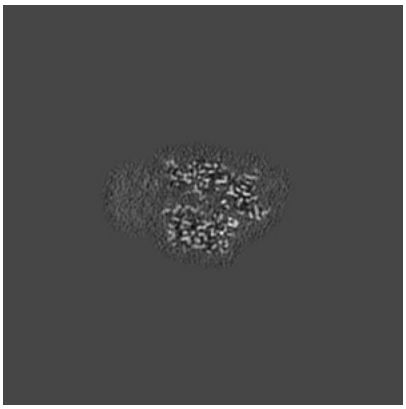
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

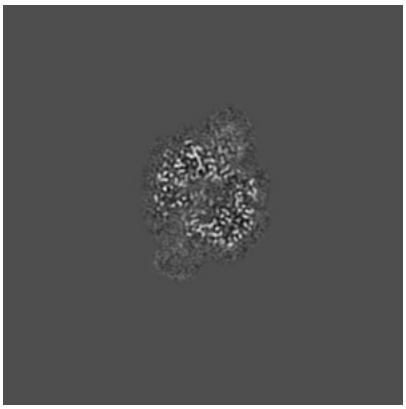
6.2.1 Primary map



X Index: 180

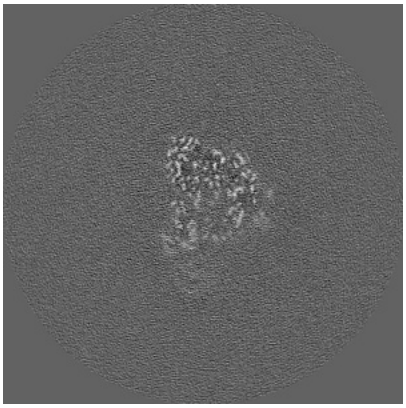


Y Index: 180

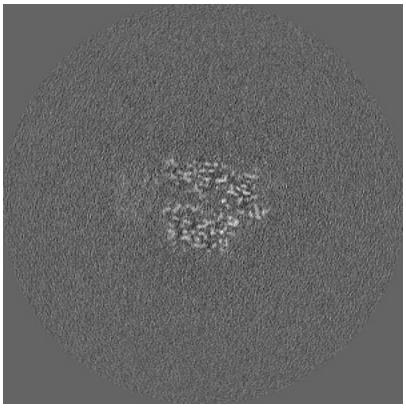


Z Index: 180

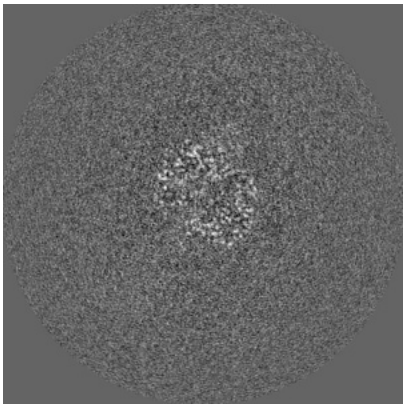
6.2.2 Raw map



X Index: 180



Y Index: 180



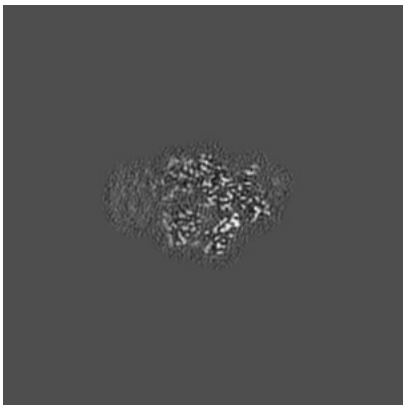
Z Index: 180

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

6.3 Largest variance slices (i)

6.3.1 Primary map

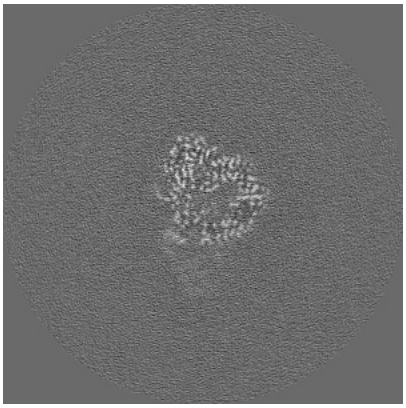
X Index: 173



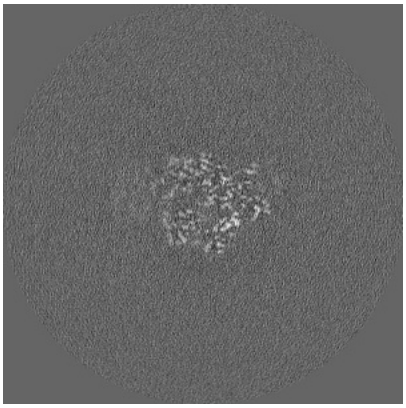
Y Index: 175

Z Index: 186

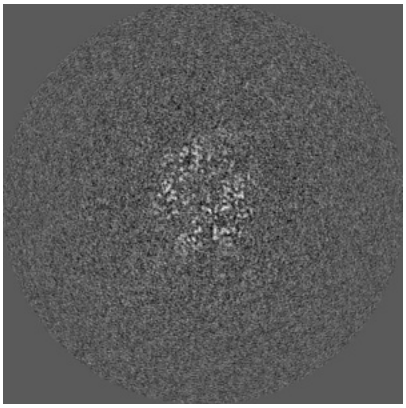
6.3.2 Raw map



X Index: 174



Y Index: 175

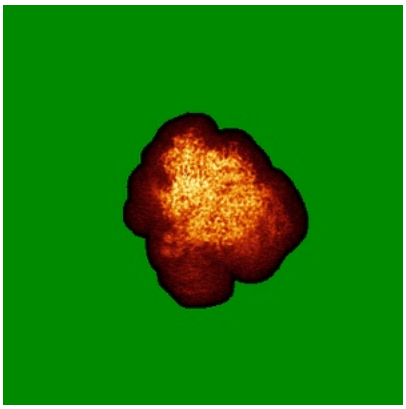


Z Index: 186

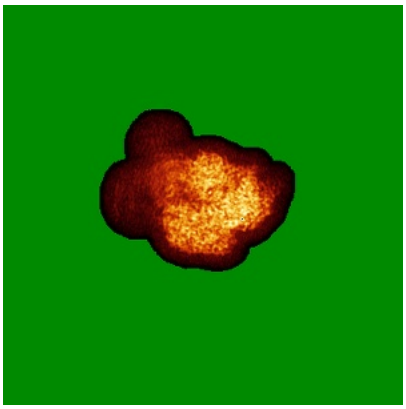
The images above show the largest variance slices of the map in three orthogonal directions.

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

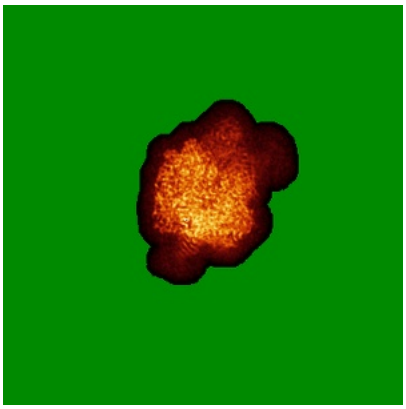
6.4.1 Primary map



X

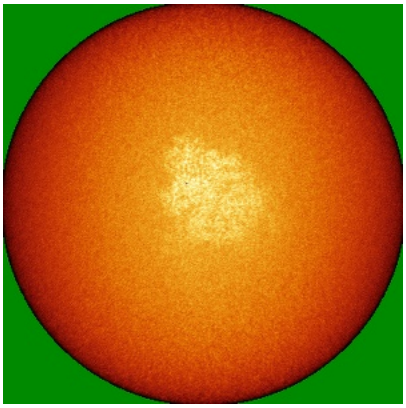


Y

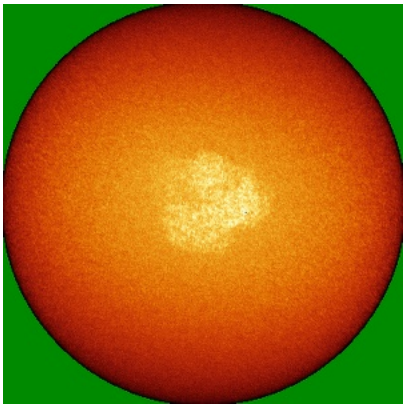


Z

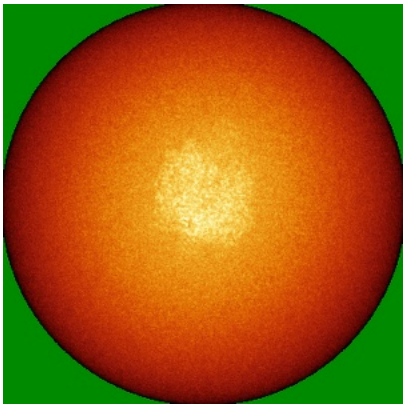
6.4.2 Raw map



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.

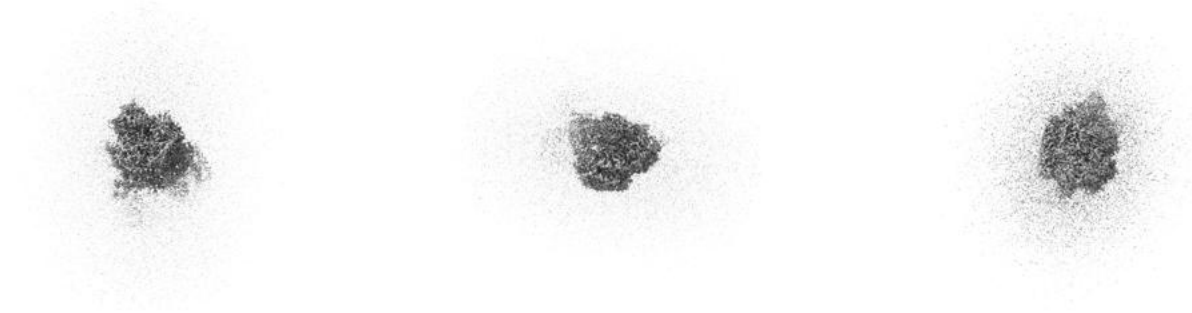
6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.01. 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.

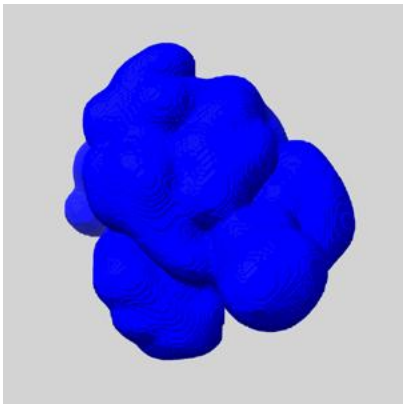
6.6 Mask visualisation

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

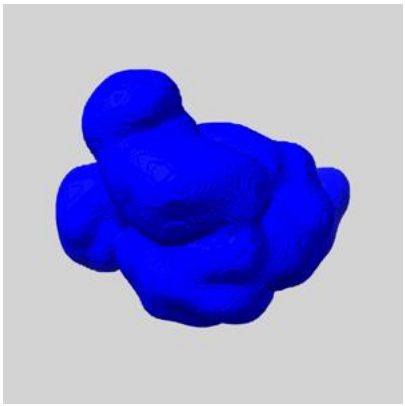
A mask typically either:

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

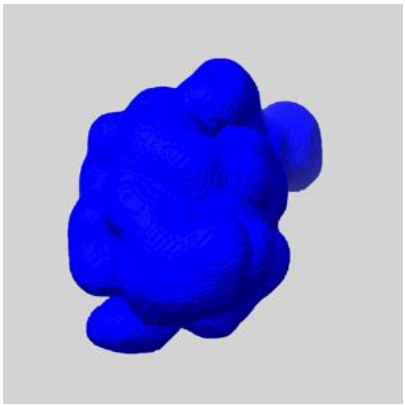
6.6.1 emd_17755_msk_1.map



X



Y

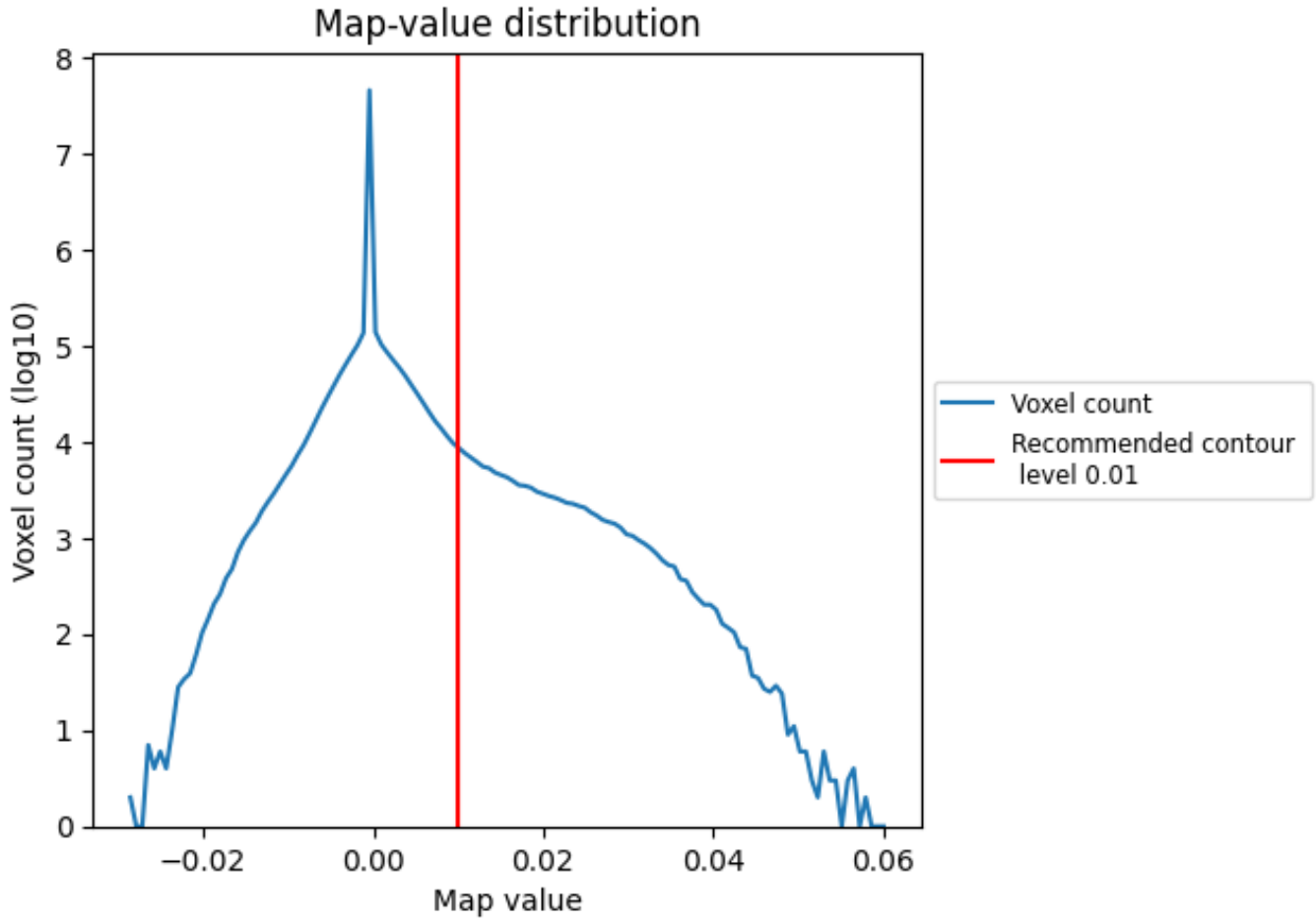


Z

7 Map analysis

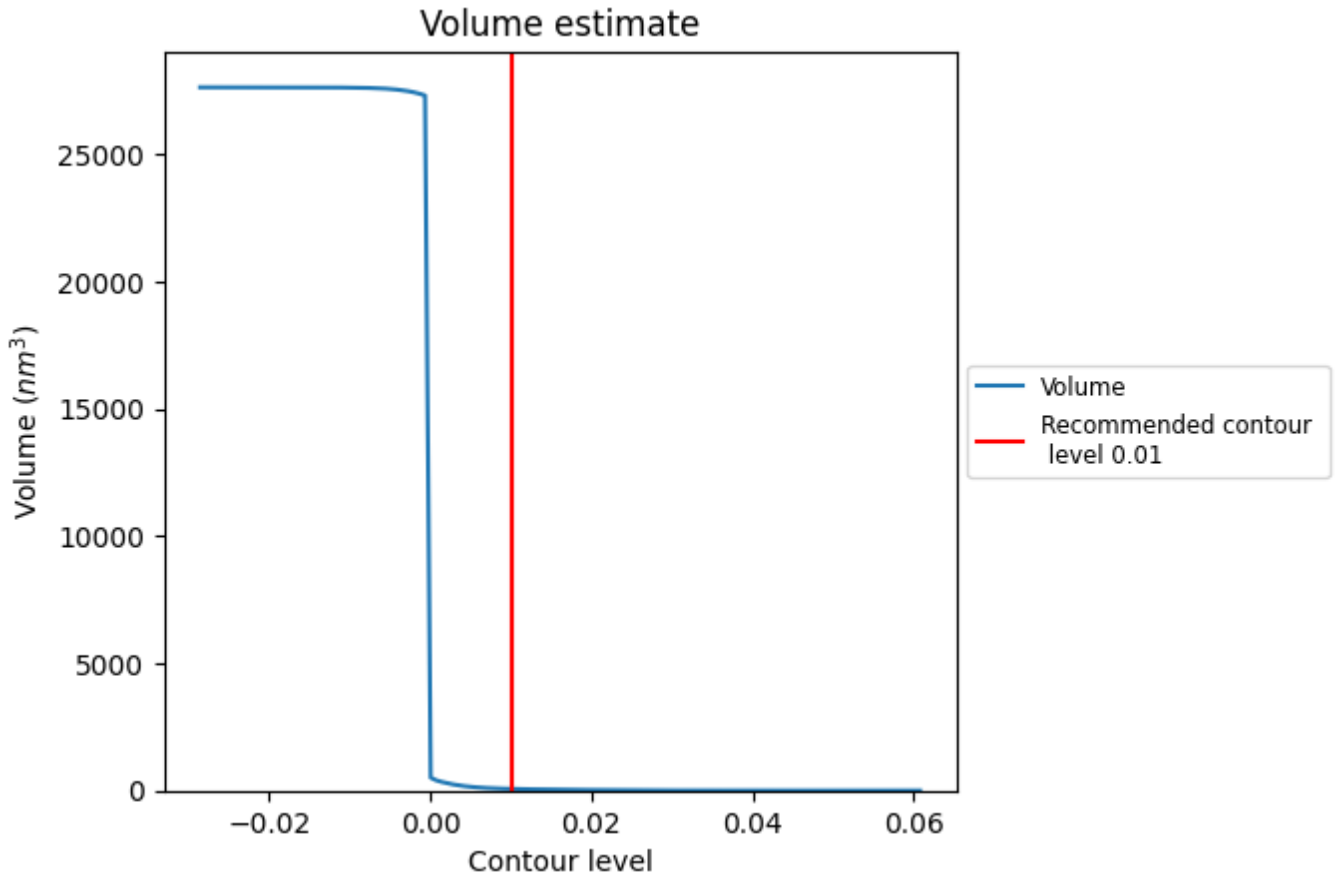
This section contains the results of statistical analysis of the map.

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.

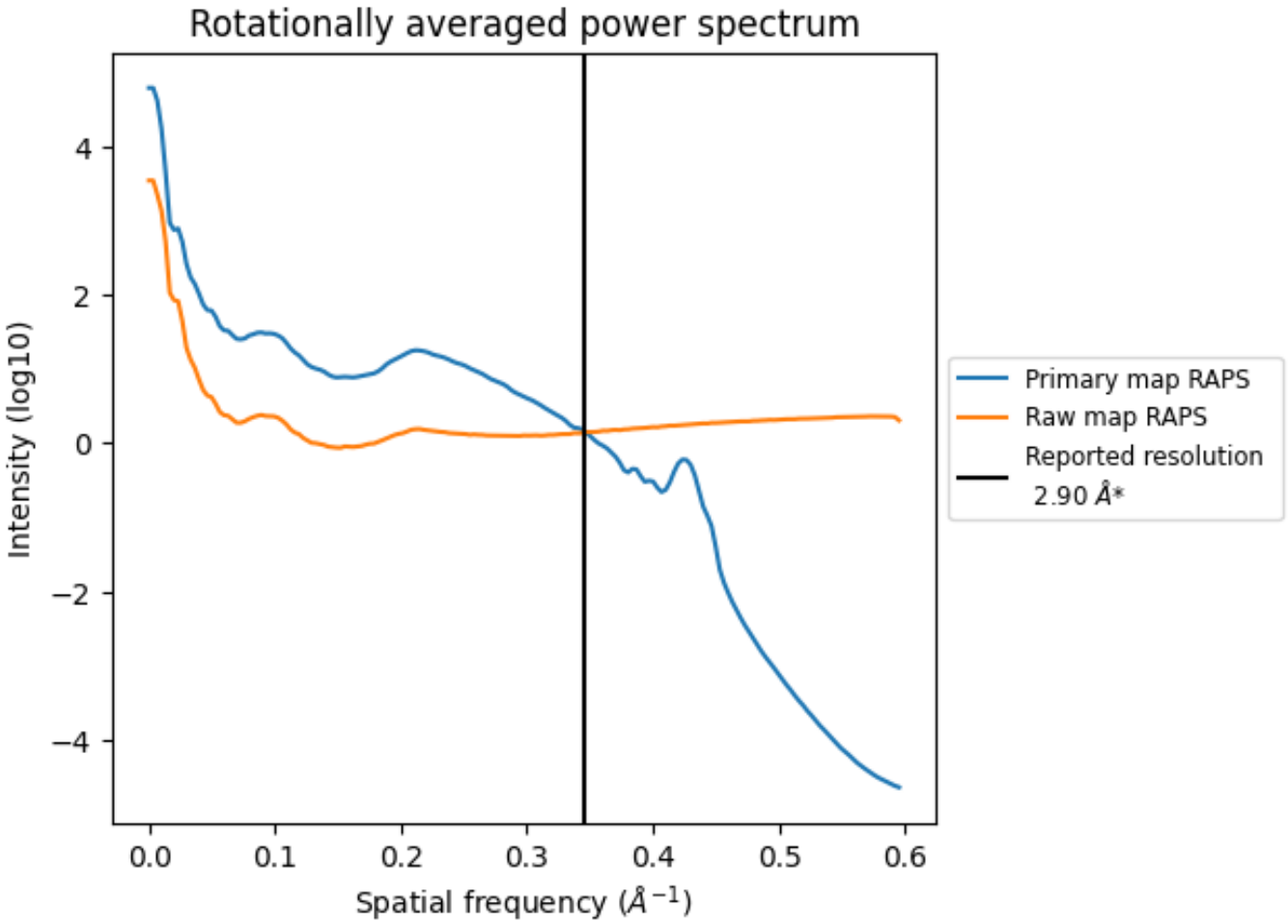
7.2 Volume estimate (i)



The volume at the recommended contour level is 66 nm^3; this corresponds to an approximate mass of 59 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)

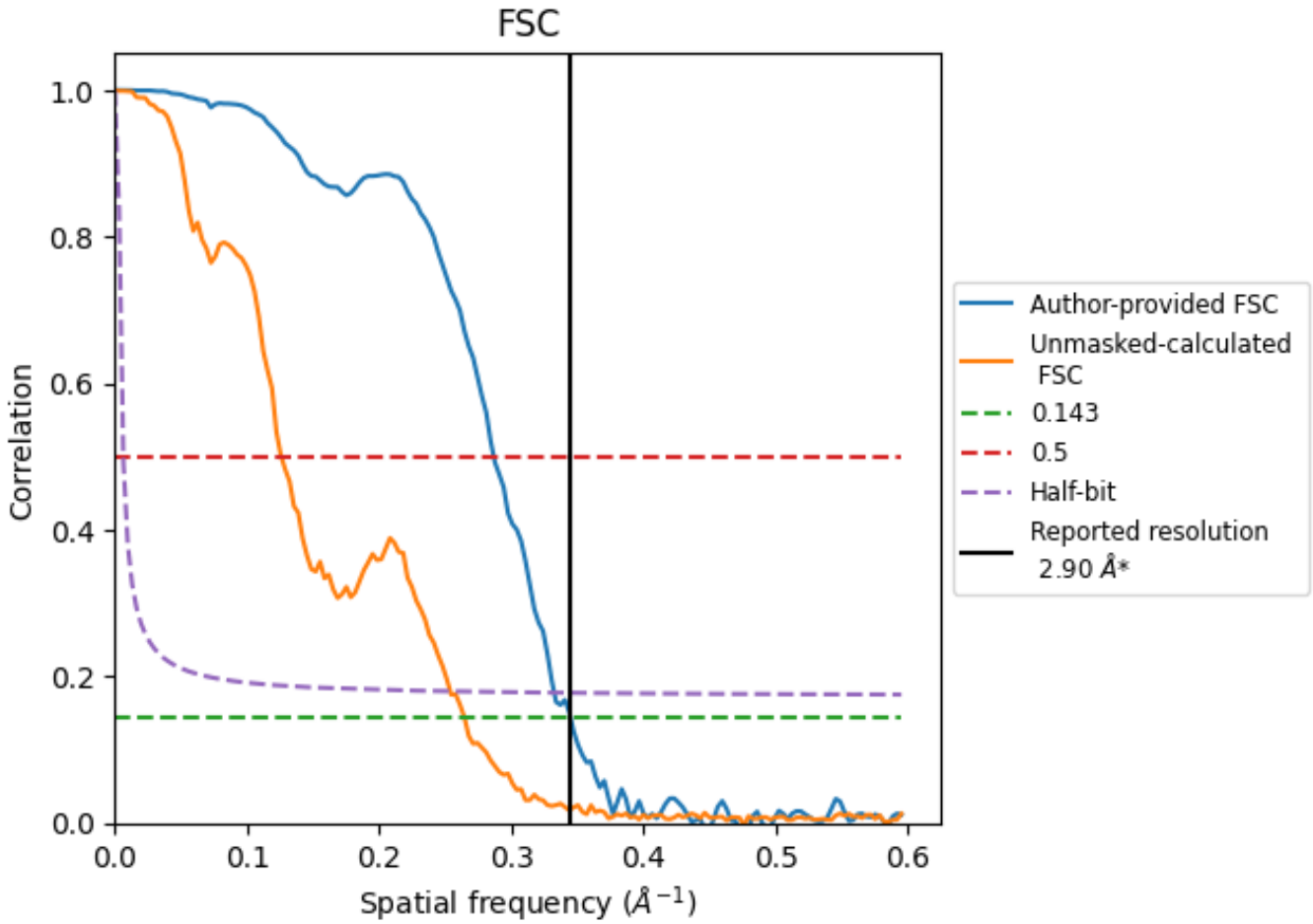


*Reported resolution corresponds to spatial frequency of 0.345 Å^{-1}

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 0.345 Å^{-1}

8.2 Resolution estimates (i)

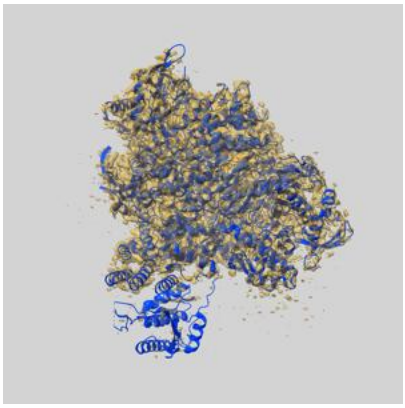
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.90	-	-
Author-provided FSC curve	2.90	3.49	3.01
Unmasked-calculated*	3.78	7.94	3.94

*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 3.78 differs from the reported value 2.9 by more than 10 %

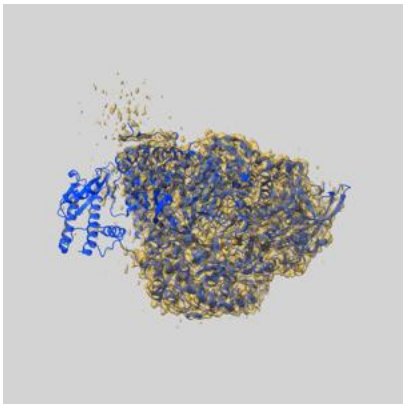
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-17755 and PDB model 8PM0. Per-residue inclusion information can be found in section 3 on page 6.

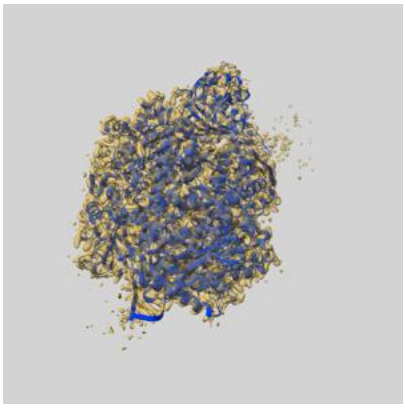
9.1 Map-model overlay



X



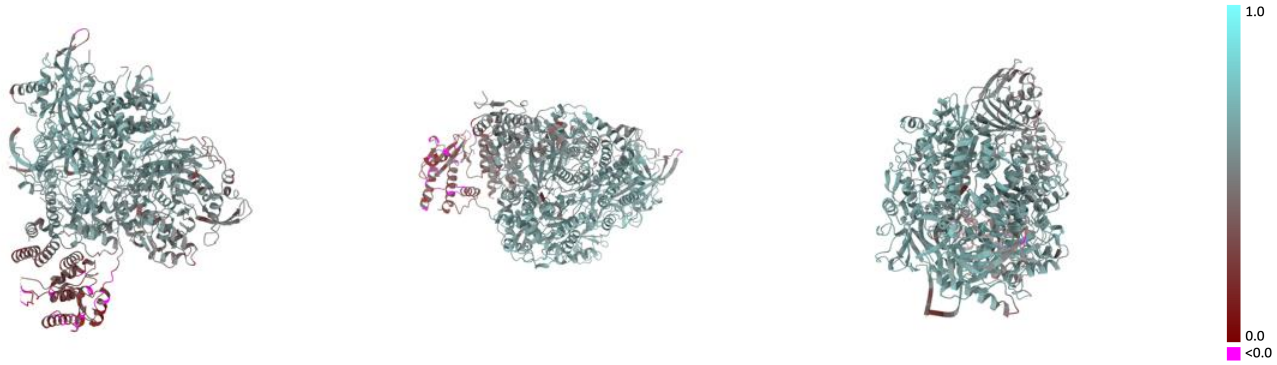
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.01 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.

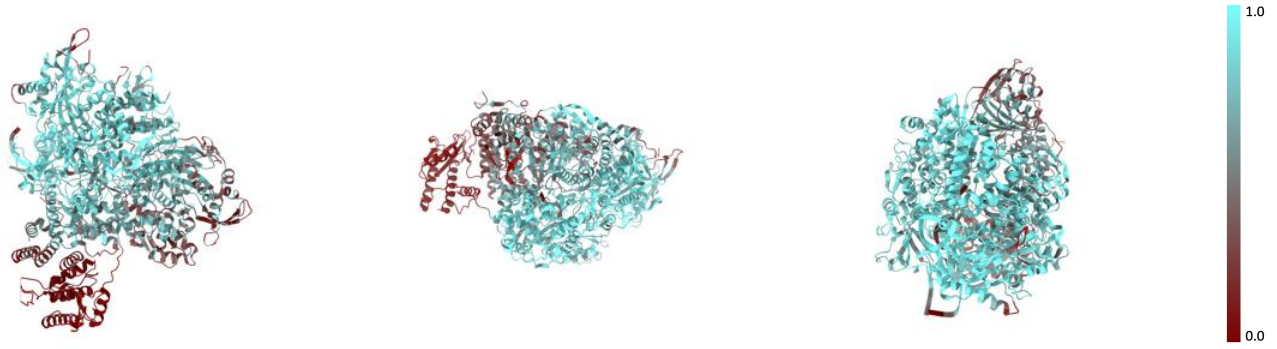
9.2 Q-score mapped to coordinate model



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.

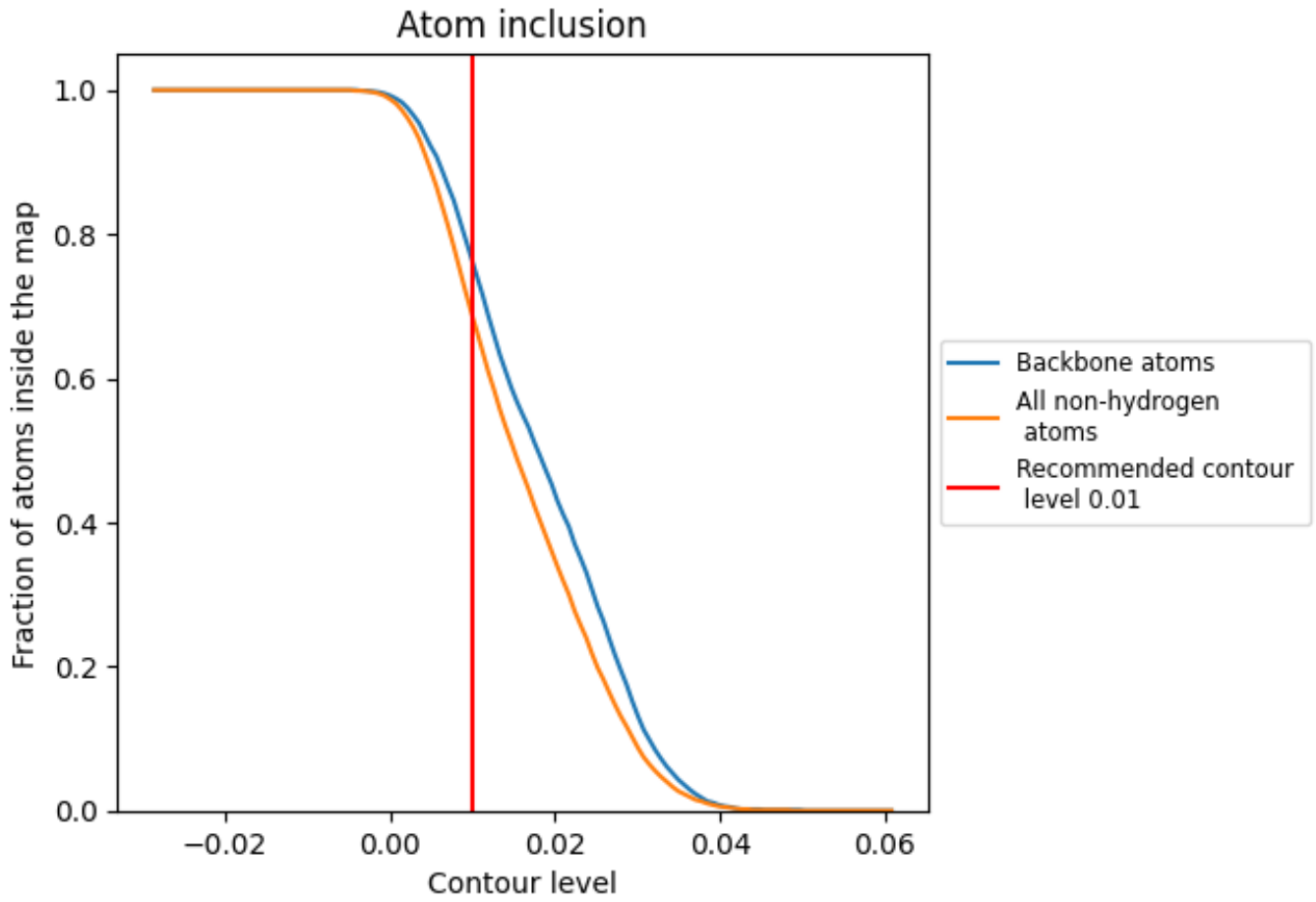
9.3 Atom inclusion mapped to coordinate model



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 (0.01).

9.4 Atom inclusion (i)



At the recommended contour level, 76% of all backbone atoms, 68% 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 (0.01) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6850	0.5460
A	0.6150	0.5030
B	0.8200	0.5980
C	0.5940	0.5360
G	0.2960	0.4850
P	0.2540	0.4830
V	0.7740	0.5570