



Full wwPDB EM Validation Report ⓘ

Jun 25, 2025 – 05:28 am BST

PDB ID : 6ZQW / pdb_00006zqw
EMDB ID : EMD-11372
Title : Cryo-EM structure of immature Spondweni virus
Authors : Renner, M.; Dejnirattisai, W.; Carrique, L.; Serna Martin, I.; Karia, D.; Ilca, S.L.; Ho, S.F.; Kotecha, A.; Keown, J.R.; Mongkolsapaya, J.; Screaton, G.R.; Grimes, J.M.
Deposited on : 2020-07-10
Resolution : 7.80 Å(reported)

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.dev118
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0rc1
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) : 2.44

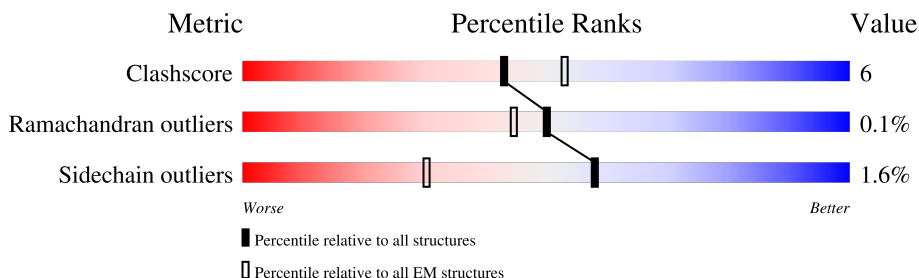
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 7.80 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

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	505	
1	D	505	
1	G	505	
2	B	169	
2	C	169	
2	E	169	
2	F	169	
2	H	169	

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Mol	Chain	Length	Quality of chain
2	I	169	<div><div></div><div>25%</div><div></div><div>70%</div></div>

2 Entry composition [i](#)

There are 3 unique types of molecules in this entry. The entry contains 15096 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 Genome polypeptide.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	504	Total	C	N	O	S	0	0
			3835	2408	676	719	32		
1	D	504	Total	C	N	O	S	0	0
			3835	2408	676	719	32		
1	G	504	Total	C	N	O	S	0	0
			3835	2408	676	719	32		

There are 6 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	37	ASN	ASP	conflict	UNP C8XPB6
A	187	ILE	PHE	conflict	UNP C8XPB6
D	37	ASN	ASP	conflict	UNP C8XPB6
D	187	ILE	PHE	conflict	UNP C8XPB6
G	37	ASN	ASP	conflict	UNP C8XPB6
G	187	ILE	PHE	conflict	UNP C8XPB6

- Molecule 2 is a protein called prM.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	101	Total	C	N	O	S	0	0
			790	489	134	157	10		
2	E	101	Total	C	N	O	S	0	0
			790	489	134	157	10		
2	H	101	Total	C	N	O	S	0	0
			790	489	134	157	10		
2	I	50	Total	C	N	O	S	0	0
			393	262	64	66	1		
2	F	50	Total	C	N	O	S	0	0
			393	262	64	66	1		
2	C	50	Total	C	N	O	S	0	0
			393	262	64	66	1		

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula:

C₈H₁₅NO₆).

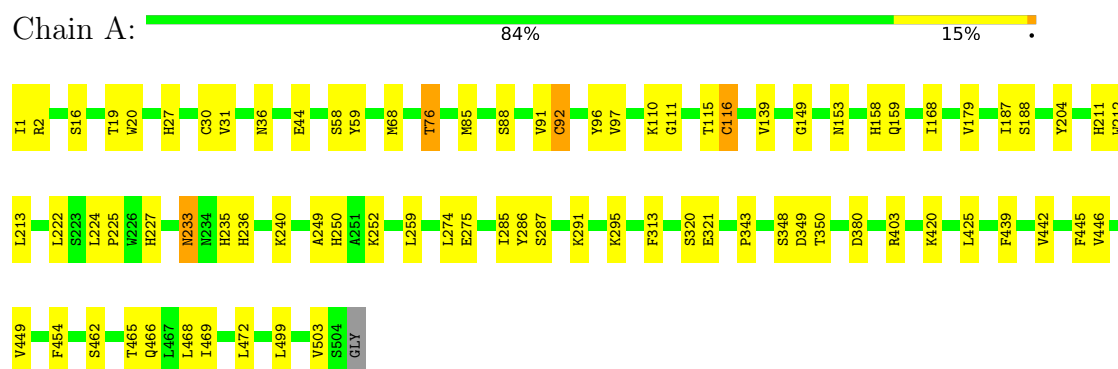


Mol	Chain	Residues	Atoms				AltConf
3	B	1	Total	C	N	O	0
			14	8	1	5	
3	E	1	Total	C	N	O	0
			14	8	1	5	
3	H	1	Total	C	N	O	0
			14	8	1	5	

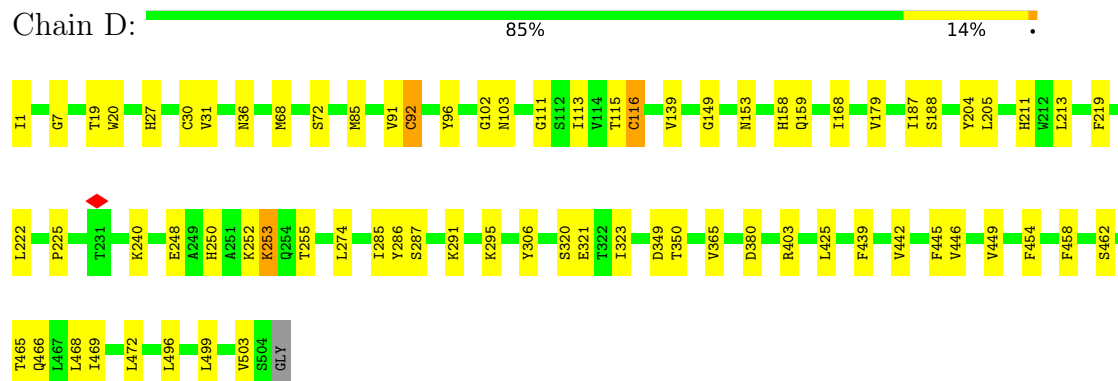
3 Residue-property plots

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.

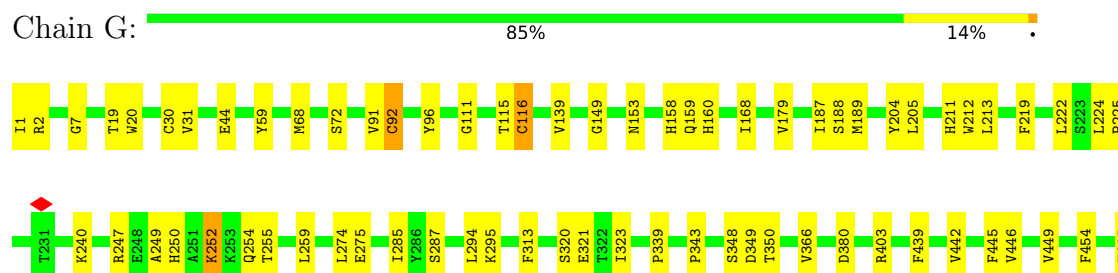
• Molecule 1: Genome polyprotein



• Molecule 1: Genome polyprotein



• Molecule 1: Genome polyprotein



GLU	PRO	GLU	ASP	VAL	ASP	CYS	TRP	CYS	ASN	SER	THR	ALA	ALA	TRP	ILE	VAL	TYR	GLY	THR	CYS	THR	HIS	LYS	THR	THR	GLY	GLU	THR	ARG	ARG	SER	ARG	ARG	SER	ILE	THR	LEU	PRO	SER	HIS	ALA	GLN	LYS	LEU	GLU	THR	ARG	SER	SER	THR	TRP	LEU	GLU	ARG	GLU	TYR	S120
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K121	S150	R151	S152	Q153	K154	I155	I156	F157	V158	S169
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● Molecule 2: prM



VAL	GLU	VAL	THR	LYS	GLY	ASP	THR	TYR	SER	THR	MET	PHE	ALA	ASP	LYS	LYS	ASP	ALA	GLY	LYS	VAL	VAL	THR	THR	PHE	GLU	THR	GLU	GLU	SER	GLY	PRO	ASN	ARG	ARG	CYS	SER	SER	ILE	GLN	ALA	MET	ASP	ILE	GLY	HIS	MET	CYS	PRO	ALA	THR	THR	ARG	MET	SER	SER	TYR	GLU	CYS	TRP	LEU	PRO	VAL	LEU	GLU	PRO	GLN	TYR
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GLU	PRO	GLU	ASP	VAL	ASP	CYS	TRP	CYS	ASN	SER	THR	ALA	ALA	TRP	ILE	VAL	TYR	GLY	THR	CYS	THR	HIS	LYS	THR	THR	THR	GLY	GLU	THR	ARG	ARG	SER	ARG	ARG	CYS	SER	ILE	THR	LEU	PRO	SER	HIS	SER	GLN	LYS	LEU	GLU	THR	ARG	SER	SER	THR	TRP	LEU	GLU	SER	ARG	GLU	TYR	S120
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K121	R132	Y136	R151	S152	Q153	K154	I155	I156	S169
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4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, I	Depositor
Number of particles used	11768	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 ($e^-/\text{\AA}^2$)	30	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.024	Depositor
Minimum map value	-0.003	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.0065	Depositor
Map size (Å)	676.0, 676.0, 676.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.69, 1.69, 1.69	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.10	0/3919	0.32	0/5297
1	D	0.10	0/3919	0.31	0/5297
1	G	0.10	0/3919	0.31	0/5297
2	B	0.12	0/809	0.41	0/1098
2	C	0.11	0/402	0.35	0/546
2	E	0.12	0/809	0.44	0/1098
2	F	0.10	0/402	0.32	0/546
2	H	0.12	0/809	0.41	0/1098
2	I	0.10	0/402	0.31	0/546
All	All	0.10	0/15390	0.33	0/20823

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3835	0	3737	50	0
1	D	3835	0	3737	45	0
1	G	3835	0	3737	47	0
2	B	790	0	746	16	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	C	393	0	419	4	0
2	E	790	0	746	19	0
2	F	393	0	419	5	0
2	H	790	0	746	18	0
2	I	393	0	419	4	0
3	B	14	0	13	0	0
3	E	14	0	13	1	0
3	H	14	0	13	0	0
All	All	15096	0	14745	190	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 6.

All (190) 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:225:PRO:HG3	1:A:240:LYS:HA	1.71	0.72
2:B:55:VAL:HG23	2:B:70:ASN:HA	1.76	0.67
2:E:55:VAL:HG23	2:E:70:ASN:HA	1.75	0.67
1:D:380:ASP:OD1	1:D:403:ARG:NH1	2.29	0.66
1:A:91:VAL:HB	1:A:240:LYS:HD2	1.76	0.66
2:H:55:VAL:HG23	2:H:70:ASN:HA	1.77	0.65
1:D:68:MET:HE2	2:E:49:MET:HG2	1.77	0.64
1:G:249:ALA:HB2	1:G:254:GLN:HE21	1.63	0.64
1:G:348:SER:OG	2:I:132:ARG:NH1	2.32	0.62
1:A:222:LEU:HD11	2:B:98:LEU:HD13	1.81	0.62
1:A:59:TYR:HD2	1:A:224:LEU:HB2	1.65	0.60
1:G:380:ASP:OD1	1:G:403:ARG:NH1	2.34	0.59
1:D:91:VAL:HB	1:D:240:LYS:HD2	1.85	0.59
1:A:380:ASP:OD1	1:A:403:ARG:NH1	2.35	0.58
1:A:233:ASN:OD1	1:A:233:ASN:N	2.37	0.57
2:H:59:GLN:NE2	2:H:59:GLN:H	2.02	0.57
1:D:72:SER:HB3	1:D:113:ILE:HD12	1.86	0.57
1:G:68:MET:HE2	2:H:49:MET:HG2	1.87	0.56
2:B:2:GLU:HB2	2:B:13:PHE:HB2	1.87	0.56
1:G:222:LEU:HD11	2:H:98:LEU:HD13	1.88	0.56
1:A:96:TYR:HA	1:A:111:GLY:O	2.05	0.56
1:A:348:SER:OG	2:C:132:ARG:NH1	2.39	0.56
2:H:2:GLU:HB2	2:H:13:PHE:HB2	1.86	0.56
1:G:205:LEU:HD12	1:G:219:PHE:HE1	1.72	0.55
1:A:36:ASN:HB3	1:A:503:VAL:HG21	1.89	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1:ILE:HD12	1:A:149:GLY:HA2	1.90	0.54
1:D:252:LYS:HE2	2:E:54:PRO:HD3	1.90	0.54
1:G:225:PRO:HG3	1:G:240:LYS:HA	1.90	0.54
1:A:68:MET:HE2	2:B:49:MET:HG2	1.89	0.54
1:A:97:VAL:HG12	1:A:249:ALA:HB1	1.89	0.54
1:A:88:SER:HB2	1:A:236:HIS:ND1	2.22	0.54
1:G:204:TYR:HH	1:G:211:HIS:CE1	2.26	0.54
1:A:58:SER:HB2	1:A:227:HIS:NE2	2.23	0.53
1:D:96:TYR:HA	1:D:111:GLY:O	2.09	0.53
1:A:58:SER:HB2	1:A:227:HIS:CE1	2.43	0.53
1:G:1:ILE:HD12	1:G:149:GLY:HA2	1.89	0.53
1:G:259:LEU:HD21	2:H:94:ARG:HG2	1.91	0.53
1:D:349:ASP:OD1	1:D:350:THR:N	2.42	0.53
1:D:153:ASN:HB3	1:D:159:GLN:HB2	1.89	0.53
1:G:153:ASN:HB3	1:G:159:GLN:HB2	1.91	0.53
1:D:36:ASN:HB3	1:D:503:VAL:HG21	1.92	0.52
1:A:349:ASP:OD1	1:A:350:THR:N	2.43	0.52
1:A:204:TYR:HH	1:A:211:HIS:CE1	2.28	0.52
1:G:250:HIS:NE2	2:H:64:ASP:OD1	2.42	0.52
1:A:259:LEU:HD21	2:B:94:ARG:HG2	1.91	0.52
1:G:349:ASP:OD1	1:G:350:THR:N	2.42	0.52
1:D:250:HIS:HB2	1:D:253:LYS:O	2.10	0.51
1:D:465:THR:O	1:D:469:ILE:HG12	2.10	0.51
1:D:204:TYR:HH	1:D:211:HIS:CE1	2.28	0.51
1:G:92:CYS:HB3	1:G:115:THR:C	2.35	0.51
1:A:188:SER:HB2	1:A:295:LYS:HB3	1.93	0.51
1:G:96:TYR:HA	1:G:111:GLY:O	2.11	0.51
1:G:465:THR:O	1:G:469:ILE:HG12	2.10	0.51
1:G:91:VAL:HB	1:G:240:LYS:HD2	1.93	0.51
1:G:91:VAL:C	1:G:116:CYS:HB3	2.36	0.50
1:D:454:PHE:HB2	1:D:499:LEU:HD23	1.94	0.50
2:E:2:GLU:HB2	2:E:13:PHE:HB2	1.94	0.50
1:A:91:VAL:C	1:A:116:CYS:HB3	2.37	0.50
1:A:465:THR:O	1:A:469:ILE:HG12	2.11	0.49
1:A:92:CYS:HB3	1:A:115:THR:C	2.36	0.49
2:B:52:GLU:HB2	2:B:75:TRP:CE2	2.48	0.49
1:A:252:LYS:HE2	2:B:54:PRO:HD3	1.93	0.49
1:A:454:PHE:HB2	1:A:499:LEU:HD23	1.95	0.49
1:G:188:SER:HB2	1:G:295:LYS:HB3	1.93	0.49
1:D:91:VAL:C	1:D:116:CYS:HB3	2.38	0.49
2:E:70:ASN:O	2:E:70:ASN:ND2	2.46	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:188:SER:HB2	1:D:295:LYS:HB3	1.94	0.49
1:D:92:CYS:HB3	1:D:115:THR:C	2.38	0.48
1:G:30:CYS:SG	1:G:31:VAL:N	2.85	0.48
1:G:247:ARG:HG3	1:G:255:THR:HG23	1.95	0.48
2:B:70:ASN:O	2:B:70:ASN:ND2	2.46	0.48
2:E:2:GLU:N	2:E:2:GLU:OE1	2.46	0.48
1:D:222:LEU:HD11	2:E:98:LEU:HD13	1.94	0.48
2:E:66:ASP:OD1	2:E:66:ASP:N	2.46	0.48
2:C:152:SER:O	2:C:156:ILE:HG12	2.13	0.48
1:A:442:VAL:HG23	1:A:445:PHE:HE1	1.79	0.48
1:D:285:ILE:HG22	1:D:287:SER:H	1.79	0.48
2:E:27:THR:HG23	2:E:29:SER:H	1.78	0.48
2:E:31:PRO:O	3:E:201:NAG:N2	2.47	0.48
1:G:72:SER:OG	1:G:252:LYS:HD2	2.14	0.48
1:A:153:ASN:HB3	1:A:159:GLN:HB2	1.96	0.48
1:A:285:ILE:HG22	1:A:287:SER:H	1.78	0.48
1:G:442:VAL:HA	1:G:445:PHE:CD1	2.49	0.48
1:A:212:TRP:CD1	1:A:275:GLU:HG2	2.49	0.47
1:A:442:VAL:HA	1:A:445:PHE:CD1	2.48	0.47
1:D:442:VAL:HA	1:D:445:PHE:CD1	2.50	0.47
1:D:1:ILE:HD12	1:D:149:GLY:HA2	1.96	0.47
2:E:52:GLU:HB2	2:E:75:TRP:CE2	2.49	0.47
2:H:57:GLU:HB3	2:H:60:TYR:HD1	1.79	0.47
1:G:139:VAL:HG23	1:G:168:ILE:HB	1.95	0.47
2:H:70:ASN:O	2:H:70:ASN:ND2	2.47	0.47
2:I:152:SER:O	2:I:156:ILE:HG12	2.15	0.47
1:G:285:ILE:HG22	1:G:287:SER:H	1.80	0.47
2:F:151:ARG:HA	2:F:154:LYS:HD2	1.97	0.47
1:A:139:VAL:HG23	1:A:168:ILE:HB	1.96	0.47
1:G:442:VAL:HG23	1:G:445:PHE:HE1	1.80	0.47
2:H:2:GLU:N	2:H:2:GLU:OE1	2.47	0.47
2:B:50:SER:HB2	2:B:77:VAL:HG23	1.97	0.47
1:D:19:THR:HG1	1:D:20:TRP:CD1	2.33	0.47
1:A:446:VAL:HA	1:A:449:VAL:HG12	1.97	0.46
2:F:152:SER:O	2:F:156:ILE:HG12	2.15	0.46
2:B:2:GLU:OE1	2:B:2:GLU:N	2.48	0.46
1:D:30:CYS:SG	1:D:31:VAL:N	2.87	0.46
1:D:103:ASN:HD22	2:E:65:VAL:HG23	1.81	0.46
1:D:139:VAL:HG23	1:D:168:ILE:HB	1.98	0.46
1:G:19:THR:HG1	1:G:20:TRP:CD1	2.34	0.46
2:H:27:THR:HG23	2:H:29:SER:H	1.81	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:442:VAL:HG23	1:D:445:PHE:HE1	1.80	0.46
2:B:34:CYS:HB2	2:B:69:CYS:HB3	1.83	0.46
1:A:30:CYS:SG	1:A:31:VAL:N	2.89	0.46
1:D:7:GLY:HA2	1:D:323:ILE:HD11	1.98	0.46
2:I:151:ARG:HA	2:I:154:LYS:HD2	1.98	0.46
1:A:291:LYS:HD2	1:A:425:LEU:HD13	1.98	0.45
1:G:439:PHE:HA	1:G:442:VAL:HG12	1.97	0.45
1:A:313:PHE:HE2	1:A:343:PRO:HD2	1.81	0.45
1:D:158:HIS:CG	1:D:159:GLN:H	2.34	0.45
1:D:446:VAL:HA	1:D:449:VAL:HG12	1.98	0.45
1:A:439:PHE:HA	1:A:442:VAL:HG12	1.98	0.45
1:A:158:HIS:CG	1:A:159:GLN:H	2.35	0.45
2:B:52:GLU:HA	2:B:75:TRP:HA	1.99	0.45
2:B:66:ASP:OD1	2:B:66:ASP:N	2.50	0.45
1:D:205:LEU:HD12	1:D:219:PHE:HE1	1.82	0.45
1:G:158:HIS:CG	1:G:159:GLN:H	2.35	0.45
1:A:19:THR:HG1	1:A:20:TRP:CD1	2.34	0.45
1:D:439:PHE:HA	1:D:442:VAL:HG12	1.98	0.45
1:G:2:ARG:NE	1:G:44:GLU:OE1	2.50	0.45
1:A:27:HIS:CE1	1:A:286:TYR:HA	2.52	0.44
1:G:179:VAL:HB	1:G:187:ILE:HG12	1.98	0.44
2:B:27:THR:HG23	2:B:29:SER:H	1.82	0.44
1:A:213:LEU:HD12	1:A:274:LEU:HD22	2.00	0.44
1:G:189:MET:HG2	1:G:294:LEU:HD22	2.00	0.44
1:G:446:VAL:HA	1:G:449:VAL:HG12	1.98	0.44
2:B:83:HIS:ND1	2:H:61:GLU:OE2	2.48	0.44
1:A:2:ARG:NE	1:A:44:GLU:OE1	2.51	0.43
2:H:52:GLU:HA	2:H:75:TRP:HA	2.00	0.43
1:D:462:SER:N	1:D:466:GLN:HE22	2.16	0.43
1:G:92:CYS:CA	1:G:116:CYS:HB3	2.49	0.43
2:H:52:GLU:HB2	2:H:75:TRP:CE2	2.53	0.43
1:A:179:VAL:HB	1:A:187:ILE:HG12	2.00	0.43
2:C:151:ARG:HA	2:C:154:LYS:HD2	2.01	0.43
1:D:92:CYS:CA	1:D:116:CYS:HB3	2.48	0.43
1:G:468:LEU:O	1:G:472:LEU:HG	2.19	0.43
2:C:120:SER:OG	2:C:121:LYS:N	2.50	0.43
2:I:120:SER:OG	2:I:121:LYS:N	2.50	0.43
1:D:102:GLY:HA3	2:E:63:GLU:HB3	2.00	0.42
1:A:468:LEU:O	1:A:472:LEU:HG	2.19	0.42
1:D:27:HIS:CE1	1:D:286:TYR:HA	2.54	0.42
1:A:462:SER:N	1:A:466:GLN:HE22	2.17	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:213:LEU:HD12	1:D:274:LEU:HD22	2.01	0.42
1:A:92:CYS:CA	1:A:116:CYS:HB3	2.48	0.42
1:G:339:PRO:HA	1:G:366:VAL:HG23	2.01	0.42
2:H:50:SER:HB2	2:H:77:VAL:HG23	2.02	0.42
1:D:103:ASN:ND2	2:E:63:GLU:O	2.53	0.42
1:D:179:VAL:HB	1:D:187:ILE:HG12	2.01	0.42
1:G:213:LEU:HD12	1:G:274:LEU:HD22	2.02	0.42
1:A:76:THR:HG23	1:D:255:THR:HG21	2.02	0.42
1:A:320:SER:OG	1:A:321:GLU:N	2.53	0.42
2:F:120:SER:OG	2:F:121:LYS:N	2.51	0.42
1:A:420:LYS:HE2	1:A:420:LYS:HB3	1.91	0.41
1:D:320:SER:OG	1:D:321:GLU:N	2.53	0.41
2:E:53:CYS:HB2	2:E:67:CYS:O	2.20	0.41
2:H:100:SER:OG	2:H:101:HIS:N	2.53	0.41
1:D:306:TYR:HD2	1:D:365:VAL:HG21	1.84	0.41
1:G:20:TRP:CZ2	1:G:295:LYS:HD2	2.55	0.41
2:B:100:SER:OG	2:B:101:HIS:N	2.54	0.41
1:D:468:LEU:O	1:D:472:LEU:HG	2.20	0.41
1:G:7:GLY:HA2	1:G:323:ILE:HD11	2.02	0.41
1:G:320:SER:OG	1:G:321:GLU:N	2.54	0.41
2:F:154:LYS:O	2:F:158:VAL:HG13	2.20	0.41
1:A:16:SER:HB2	1:A:503:VAL:HB	2.01	0.41
1:A:85:MET:HG2	1:A:92:CYS:SG	2.60	0.41
1:G:92:CYS:N	1:G:116:CYS:HB3	2.36	0.41
1:G:212:TRP:CD1	1:G:275:GLU:HG2	2.56	0.41
2:E:100:SER:OG	2:E:101:HIS:N	2.53	0.41
1:G:313:PHE:HE2	1:G:343:PRO:HD2	1.86	0.41
1:G:454:PHE:HB2	1:G:499:LEU:HD23	2.03	0.41
2:H:57:GLU:HB3	2:H:60:TYR:CD1	2.54	0.41
1:A:20:TRP:CZ2	1:A:295:LYS:HD2	2.55	0.41
1:D:225:PRO:HG3	1:D:240:LYS:HA	2.03	0.41
1:D:458:PHE:HE2	1:D:496:LEU:HD22	1.86	0.41
1:G:59:TYR:HD2	1:G:224:LEU:HB2	1.86	0.41
2:E:34:CYS:HB2	2:E:69:CYS:HB3	1.86	0.40
2:E:50:SER:HB2	2:E:77:VAL:HG23	2.02	0.40
2:E:52:GLU:HA	2:E:75:TRP:HA	2.03	0.40
2:H:34:CYS:HB2	2:H:69:CYS:HB3	1.84	0.40
1:D:85:MET:HE2	1:D:85:MET:HB3	1.98	0.40
1:G:92:CYS:HA	1:G:115:THR:O	2.21	0.40
1:G:153:ASN:HB2	1:G:160:HIS:NE2	2.36	0.40
1:D:291:LYS:HD2	1:D:425:LEU:HD13	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:F:150:SER:HB3	2:F:153:GLN:HG3	2.02	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	502/505 (99%)	488 (97%)	14 (3%)	0	100	100
1	D	502/505 (99%)	490 (98%)	11 (2%)	1 (0%)	44	78
1	G	502/505 (99%)	490 (98%)	12 (2%)	0	100	100
2	B	99/169 (59%)	93 (94%)	6 (6%)	0	100	100
2	C	48/169 (28%)	48 (100%)	0	0	100	100
2	E	99/169 (59%)	90 (91%)	8 (8%)	1 (1%)	13	49
2	F	48/169 (28%)	48 (100%)	0	0	100	100
2	H	99/169 (59%)	93 (94%)	6 (6%)	0	100	100
2	I	48/169 (28%)	48 (100%)	0	0	100	100
All	All	1947/2529 (77%)	1888 (97%)	57 (3%)	2 (0%)	50	83

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	E	64	ASP
1	D	248	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	406/406 (100%)	399 (98%)	7 (2%)	56	72
1	D	406/406 (100%)	403 (99%)	3 (1%)	81	87
1	G	406/406 (100%)	403 (99%)	3 (1%)	81	87
2	B	89/148 (60%)	86 (97%)	3 (3%)	32	51
2	C	42/148 (28%)	41 (98%)	1 (2%)	44	62
2	E	89/148 (60%)	85 (96%)	4 (4%)	23	45
2	F	42/148 (28%)	42 (100%)	0	100	100
2	H	89/148 (60%)	85 (96%)	4 (4%)	23	45
2	I	42/148 (28%)	42 (100%)	0	100	100
All	All	1611/2106 (76%)	1586 (98%)	25 (2%)	58	73

All (25) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	76	THR
1	A	92	CYS
1	A	110	LYS
1	A	116	CYS
1	A	233	ASN
1	A	235	HIS
1	A	250	HIS
2	B	69	CYS
2	B	94	ARG
2	B	101	HIS
1	D	92	CYS
1	D	116	CYS
1	D	253	LYS
2	E	39	MET
2	E	69	CYS
2	E	94	ARG
2	E	101	HIS
1	G	92	CYS
1	G	116	CYS
1	G	252	LYS
2	H	56	LEU
2	H	69	CYS

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Mol	Chain	Res	Type
2	H	94	ARG
2	H	101	HIS
2	C	136	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (19) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	131	GLN
1	A	227	HIS
1	A	363	ASN
1	A	400	HIS
2	B	37	GLN
1	D	103	ASN
1	D	131	GLN
1	D	235	HIS
1	D	250	HIS
1	D	400	HIS
2	E	37	GLN
2	E	83	HIS
1	G	131	GLN
1	G	235	HIS
1	G	254	GLN
1	G	363	ASN
1	G	400	HIS
2	H	37	GLN
2	H	59	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

3 ligands 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	$\# Z > 2$
3	NAG	B	201	2	14,14,15	0.21	0	17,19,21	0.42	0
3	NAG	E	201	2	14,14,15	0.20	0	17,19,21	0.43	0
3	NAG	H	201	2	14,14,15	0.20	0	17,19,21	0.43	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
3	NAG	B	201	2	-	3/6/23/26	0/1/1/1
3	NAG	E	201	2	-	3/6/23/26	0/1/1/1
3	NAG	H	201	2	-	4/6/23/26	0/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	B	201	NAG	C8-C7-N2-C2
3	B	201	NAG	O7-C7-N2-C2
3	E	201	NAG	C8-C7-N2-C2
3	E	201	NAG	O7-C7-N2-C2
3	H	201	NAG	C8-C7-N2-C2
3	H	201	NAG	O7-C7-N2-C2
3	H	201	NAG	O5-C5-C6-O6
3	B	201	NAG	O5-C5-C6-O6
3	E	201	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
3	H	201	NAG	C4-C5-C6-O6

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	E	201	NAG	1	0

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

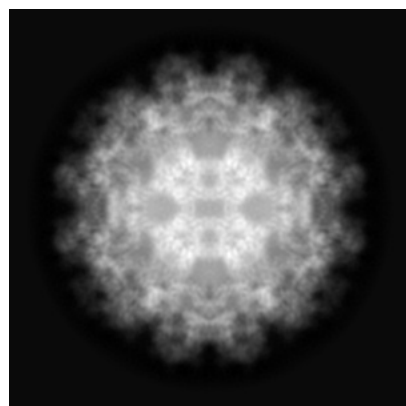
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-11372. These allow visual inspection of the internal detail of the map and identification of artifacts.

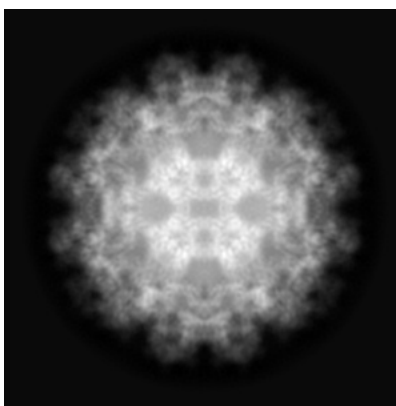
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

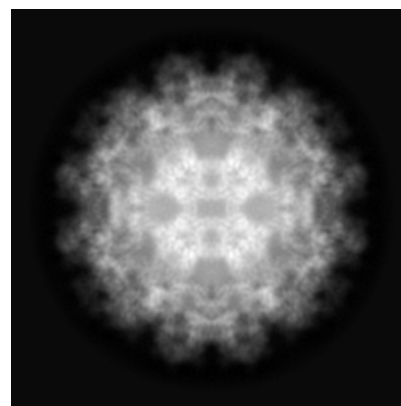
6.1.1 Primary map



X

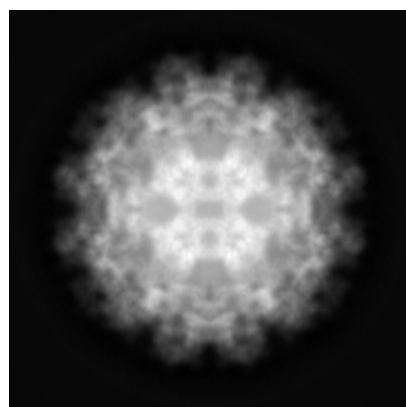


Y

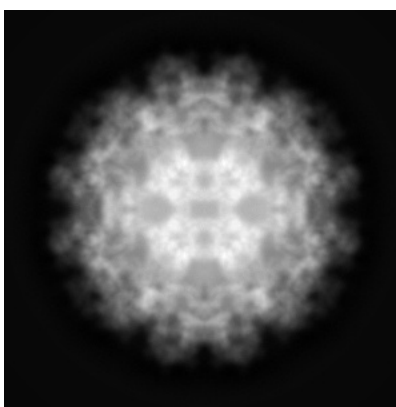


Z

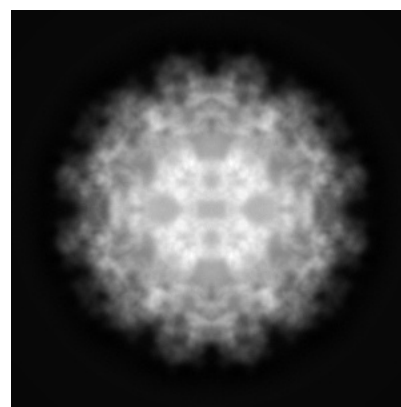
6.1.2 Raw map



X



Y

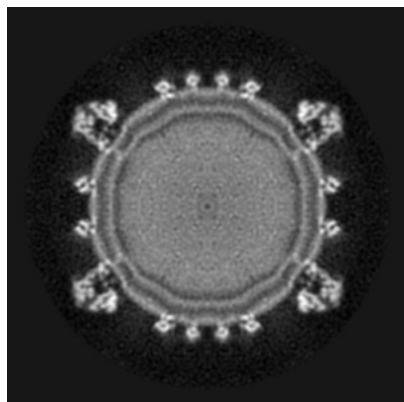


Z

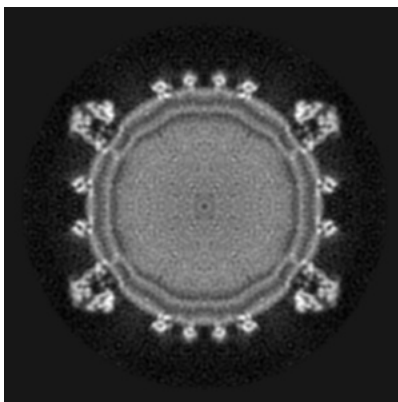
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

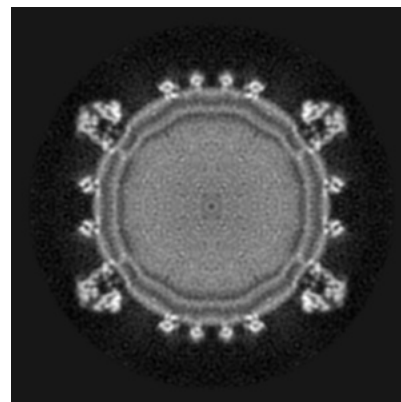
6.2.1 Primary map



X Index: 200

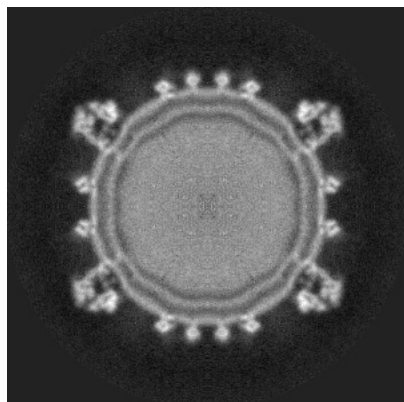


Y Index: 200

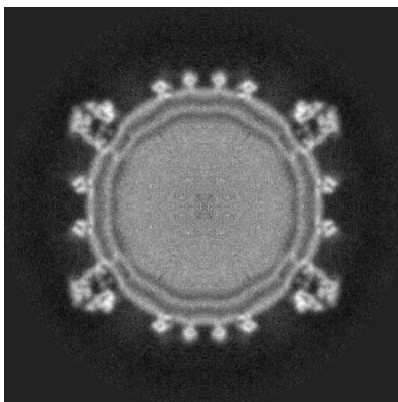


Z Index: 200

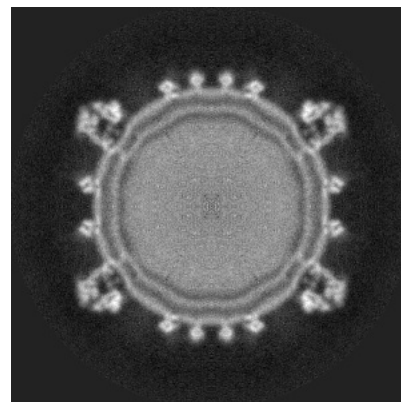
6.2.2 Raw map



X Index: 200



Y Index: 200

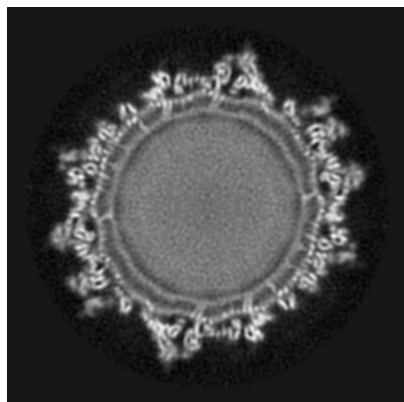


Z Index: 200

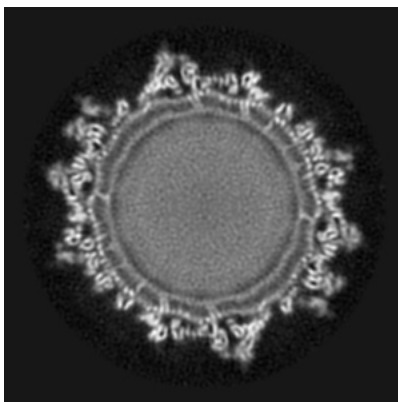
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

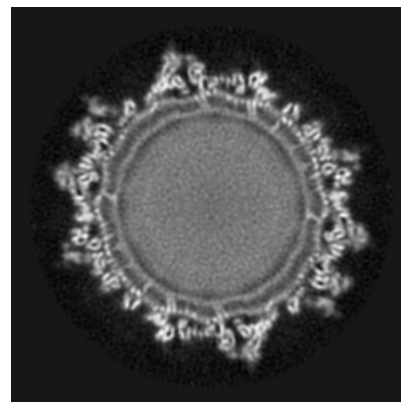
6.3.1 Primary map



X Index: 219

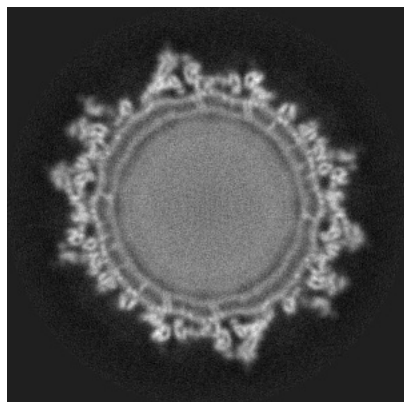


Y Index: 181

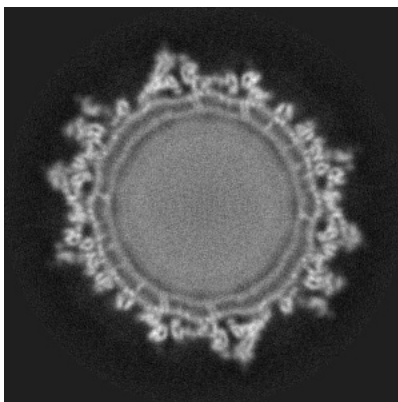


Z Index: 181

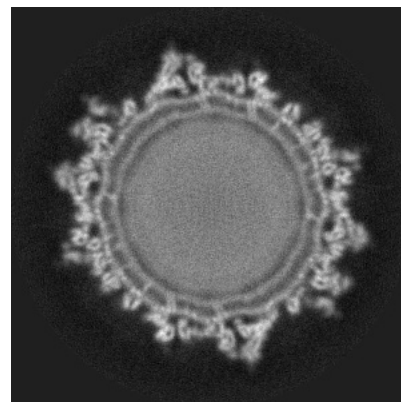
6.3.2 Raw map



X Index: 181



Y Index: 181

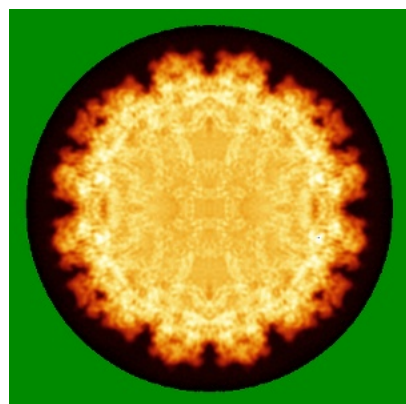


Z Index: 181

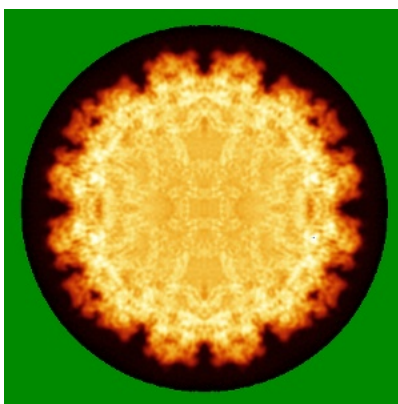
The images above show the largest variance slices of the map in three orthogonal directions.

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

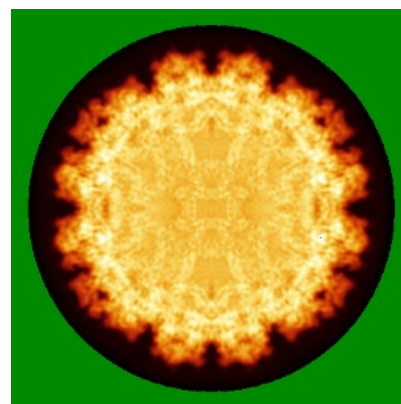
6.4.1 Primary map



X

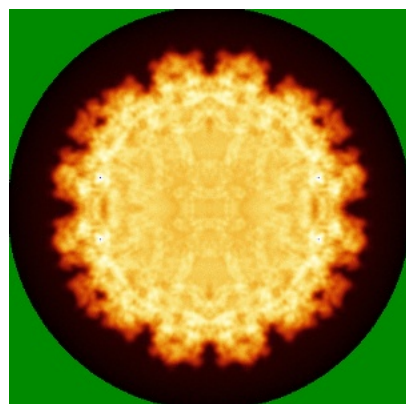


Y

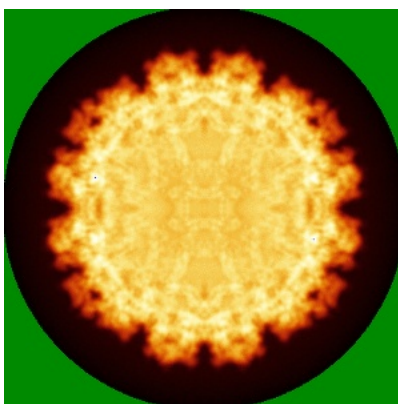


Z

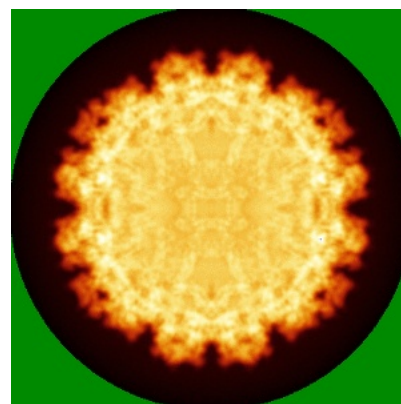
6.4.2 Raw map



X



Y

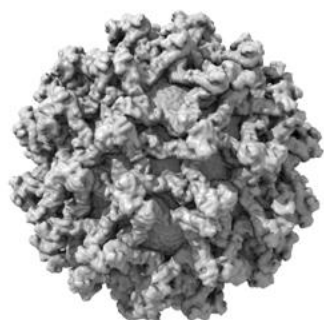


Z

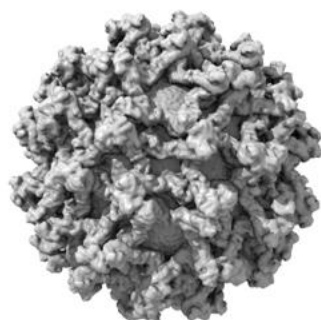
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



X



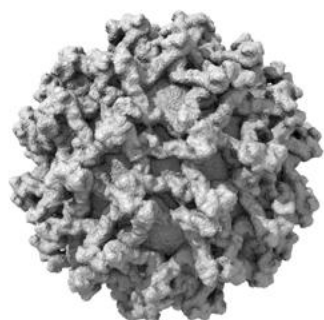
Y



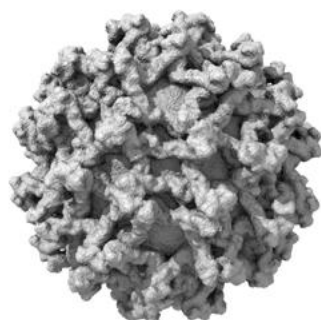
Z

The images above show the 3D surface view of the map at the recommended contour level 0.0065. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

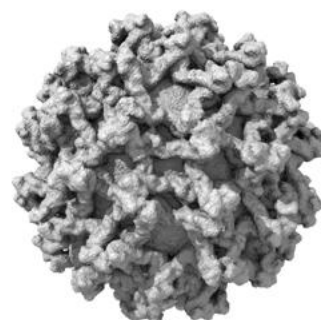
6.5.2 Raw map



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.

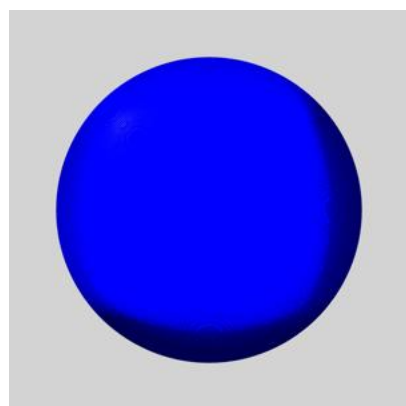
6.6 Mask visualisation [i](#)

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

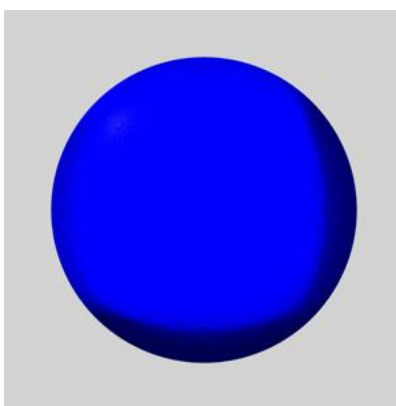
A mask typically either:

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

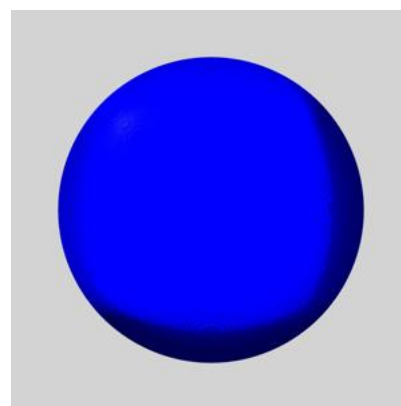
6.6.1 emd_11372_msk_1.map [i](#)



X



Y

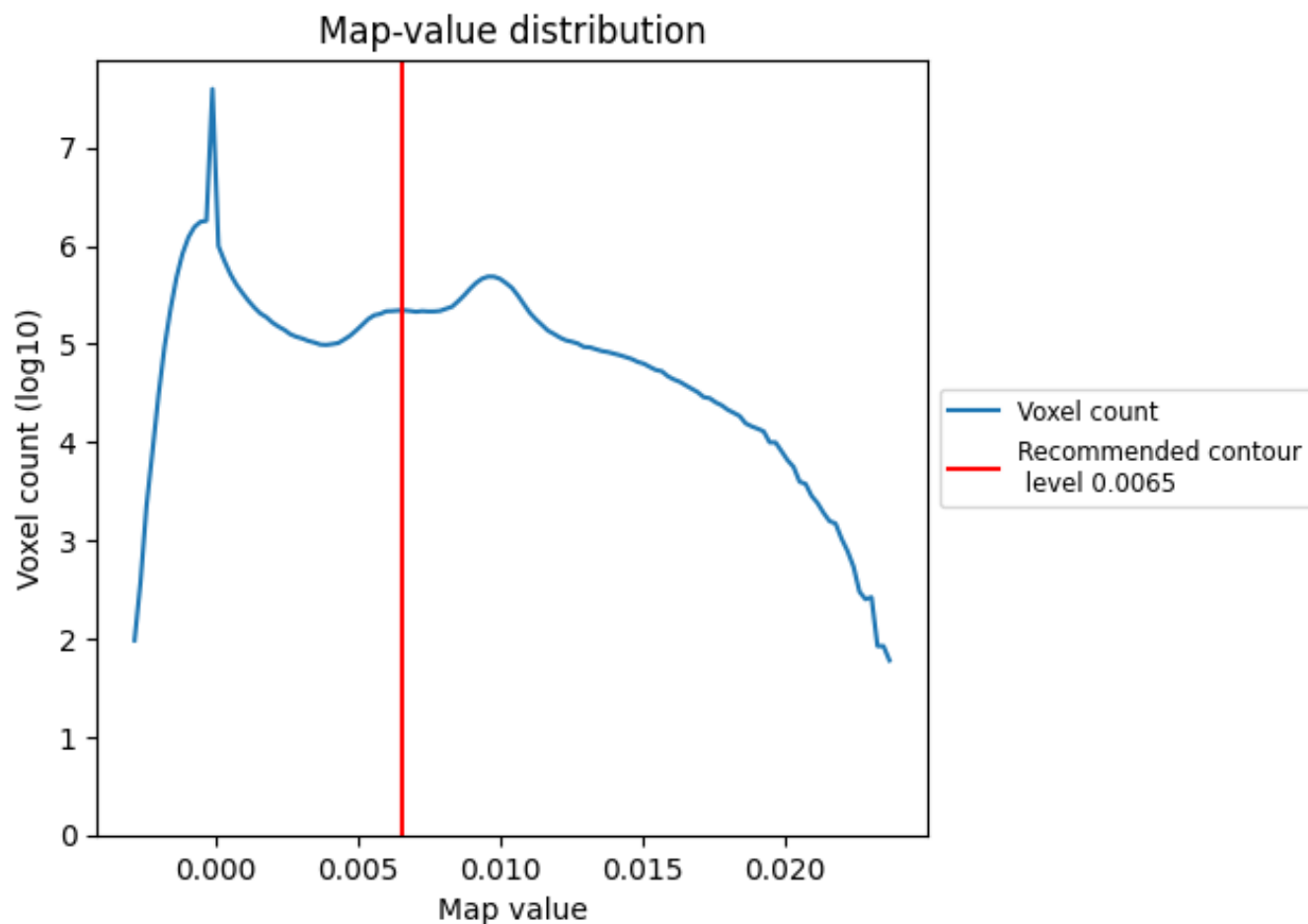


Z

7 Map analysis [i](#)

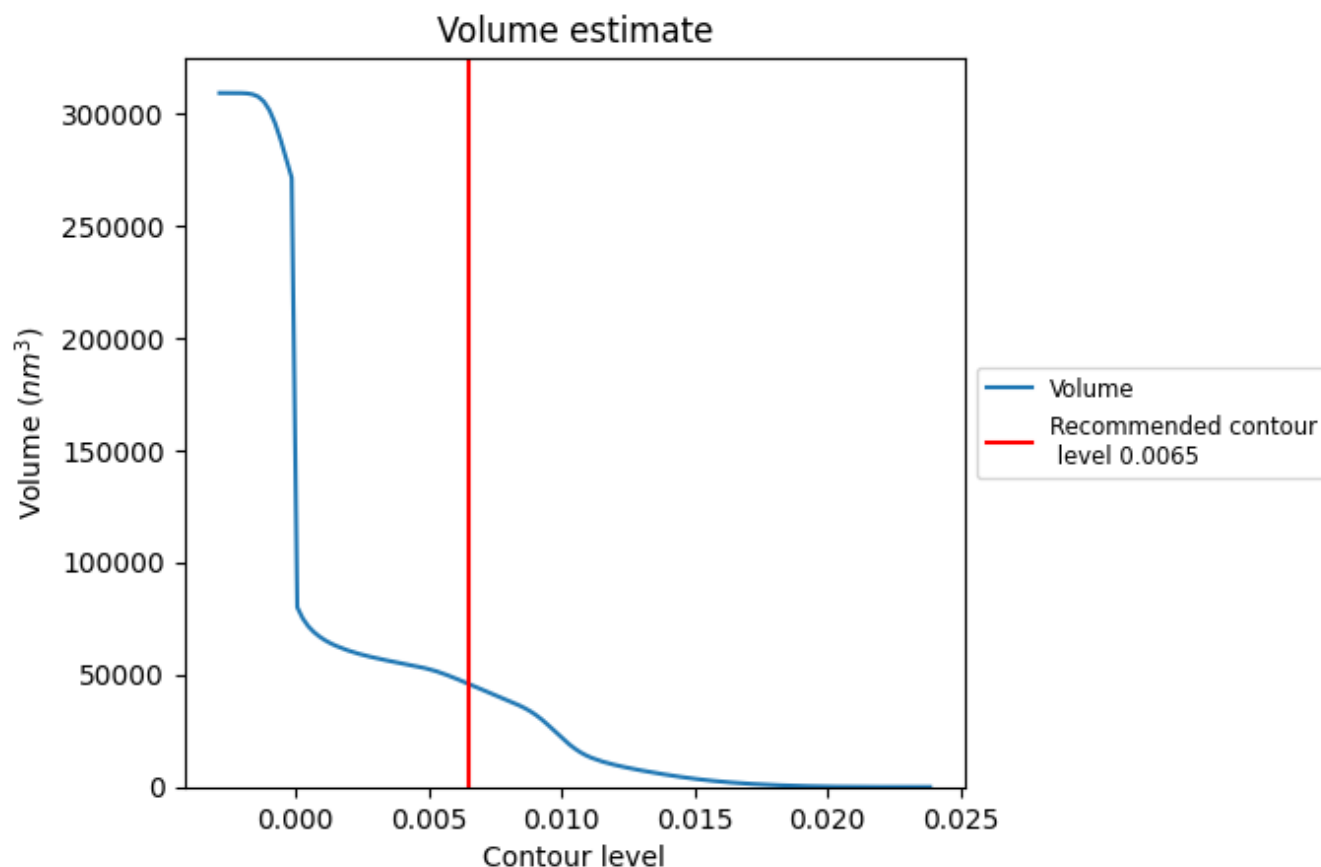
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



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

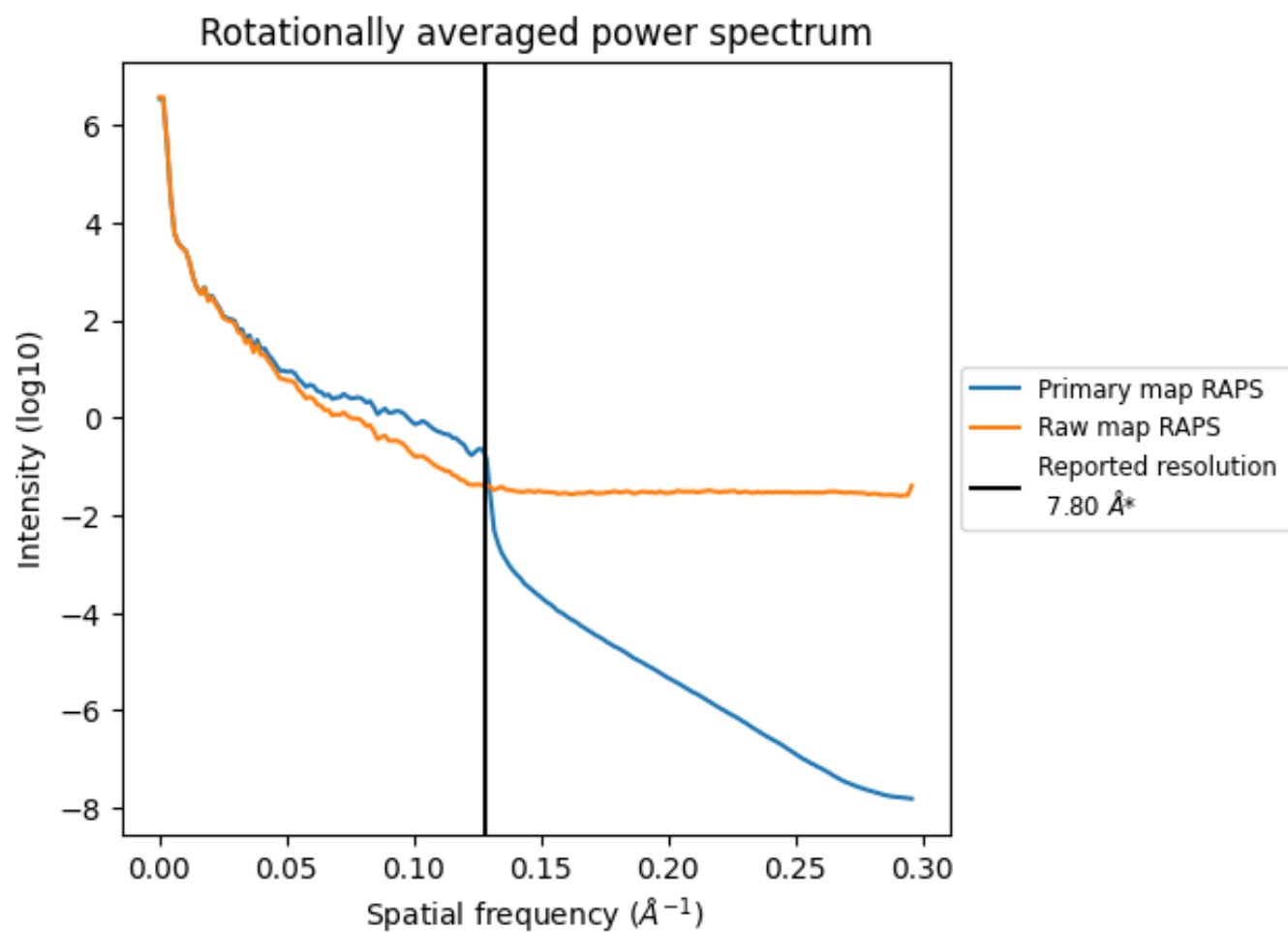
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 45893 nm^3 ; this corresponds to an approximate mass of 41457 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 ⓘ

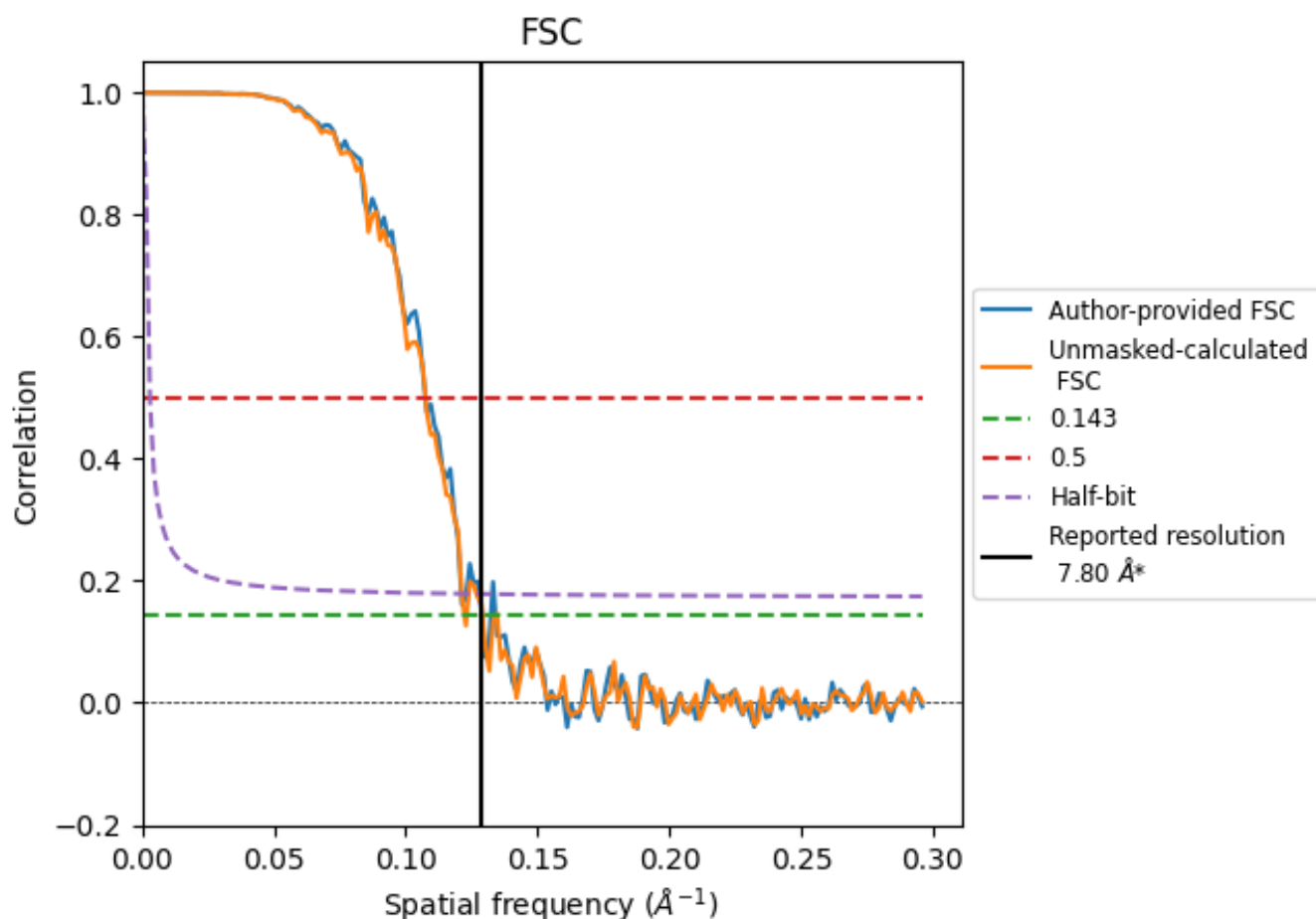


*Reported resolution corresponds to spatial frequency of 0.128 \AA^{-1}

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.128 \AA^{-1}

8.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	7.80	-	-
Author-provided FSC curve	7.76	9.30	8.26
Unmasked-calculated*	8.18	9.30	8.25

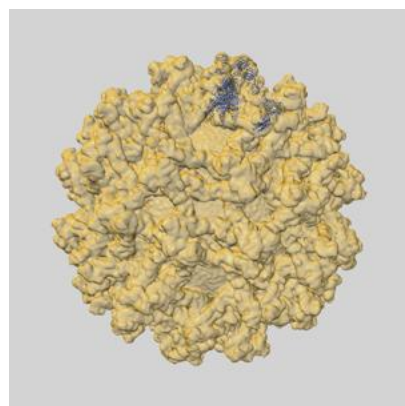
*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

9 Map-model fit [i](#)

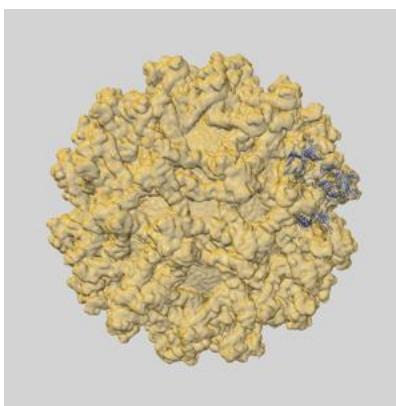
This section contains information regarding the fit between EMDB map EMD-11372 and PDB model 6ZQW. Per-residue inclusion information can be found in section [3](#) on page [6](#).

9.1 Map-model overlays

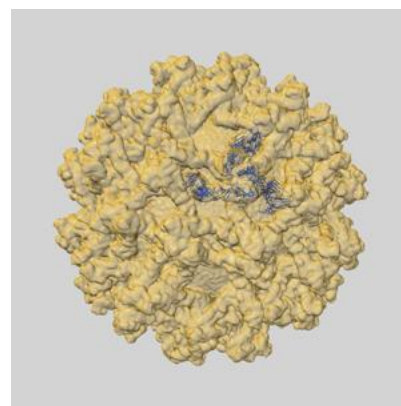
9.1.1 Map-model overlay [i](#)



X

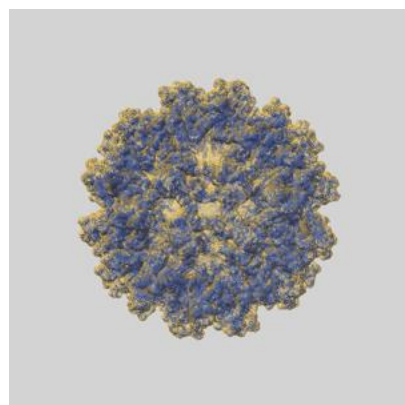


Y

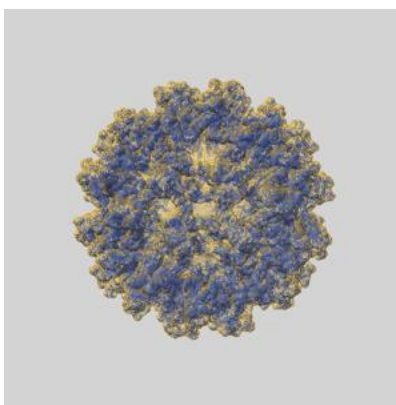


Z

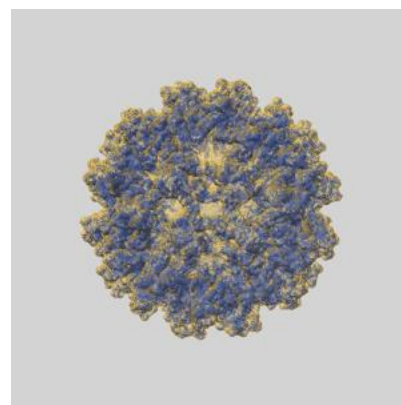
9.1.2 Map-model assembly overlay [i](#)



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0065 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](#)



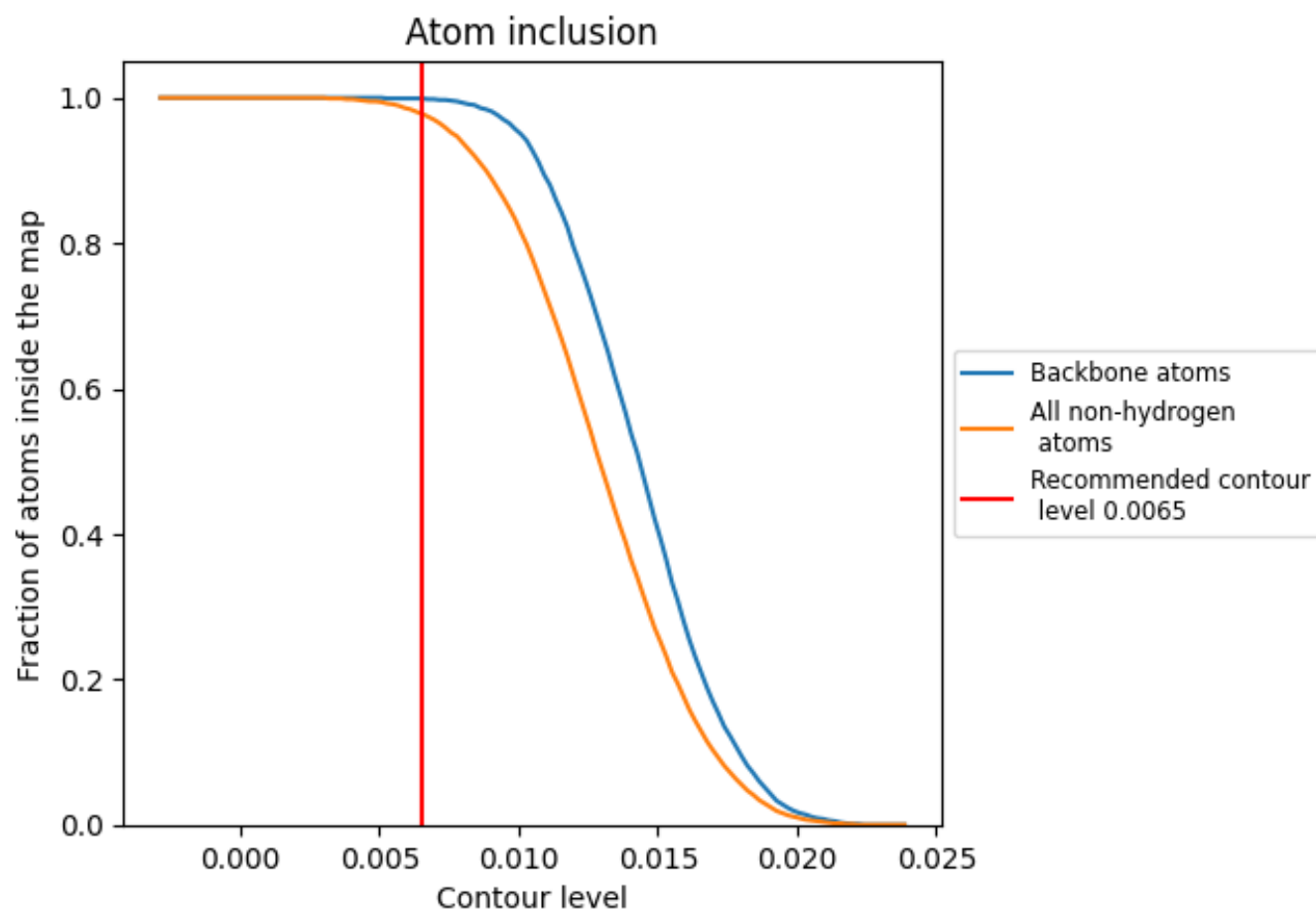
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.0065).

9.4 Atom inclusion [i](#)



At the recommended contour level, 100% of all backbone atoms, 98% 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 (0.0065) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div><div></div>0.9780</div>	<div><div></div>0.1540</div>
A	<div><div></div>0.9840</div>	<div><div></div>0.1560</div>
B	<div><div></div>0.9530</div>	<div><div></div>0.1520</div>
C	<div><div></div>0.9920</div>	<div><div></div>0.1640</div>
D	<div><div></div>0.9810</div>	<div><div></div>0.1530</div>
E	<div><div></div>0.9540</div>	<div><div></div>0.1480</div>
F	<div><div></div>0.9870</div>	<div><div></div>0.1700</div>
G	<div><div></div>0.9810</div>	<div><div></div>0.1520</div>
H	<div><div></div>0.9530</div>	<div><div></div>0.1450</div>
I	<div><div></div>0.9790</div>	<div><div></div>0.1610</div>

1.0

0.0

<0.0