Full wwPDB EM Validation Report (i)

Jun 8, 2024 – 09:02 AM EDT

PDB ID	:	8EAT
EMDB ID	:	EMD-27985
Title	:	Yeast VO missing subunits a, e, and f in complex with Vma12-22p
Authors	:	Wang, H.; Bueler, S.A.; Rubinstein, J.L.
Deposited on	:	2022-08-29
Resolution	:	3.10 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 (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:

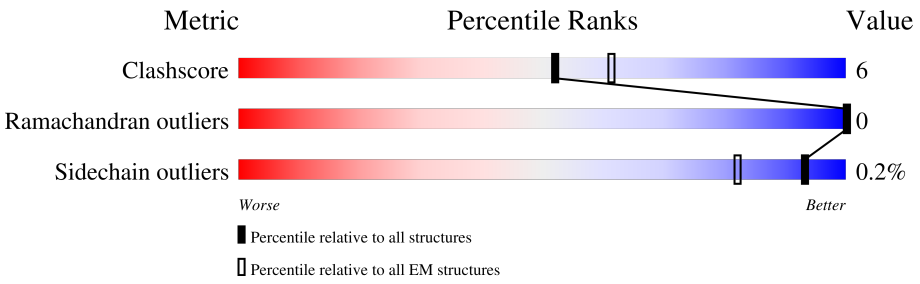
EMDB validation analysis	:	0.0.1.dev92
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.36.2

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.10 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	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	181	8% 59% 13% 28%
2	B	215	23% 42% • 54%
3	F	118	16% 81% 16% •
4	b	265	17% 83%
5	c	213	93% 7%
6	d	345	9% 98% •
7	g	160	• 99% •
7	h	160	98% ••

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Mol	Chain	Length	Quality of chain
7	i	160	99%
7	j	160	99%
7	k	160	99%
7	l	160	99%
7	m	160	99%
7	n	160	99%
8	o	164	96%

2 Entry composition (i)

There are 8 unique types of molecules in this entry. The entry contains 34663 atoms, of which 17463 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 Vacuolar ATPase assembly protein VMA22.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	130	1914	629	925	165	193	2	0	0

- Molecule 2 is a protein called Vacuolar ATPase assembly integral membrane protein VPH2.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
2	B	98	1253	443	567	123	117	3	0	0

- Molecule 3 is a protein called V-type proton ATPase subunit F.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	H	N	O		
3	F	115	1598	533	763	143	159	0	0

- Molecule 4 is a protein called V0 assembly protein 1.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
4	b	46	730	237	375	50	66	2	0	0

- Molecule 5 is a protein called V-type proton ATPase subunit c".

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
5	c	198	3008	979	1538	228	256	7	0	0

- Molecule 6 is a protein called V-type proton ATPase subunit d.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
6	d	338	5233	1708	2547	440	525	13	0	0

- Molecule 7 is a protein called V-type proton ATPase subunit c.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
7	g	158	2334	746	1202	181	198	7	0	0
7	h	158	2334	746	1202	181	198	7	0	0
7	i	158	2334	746	1202	181	198	7	0	0
7	j	158	2334	746	1202	181	198	7	0	0
7	k	158	2329	745	1200	181	196	7	0	0
7	l	158	2302	740	1183	177	195	7	0	0
7	m	159	2339	748	1202	182	199	8	0	0
7	n	159	2313	743	1184	179	200	7	0	0

- Molecule 8 is a protein called V-type proton ATPase subunit c'.

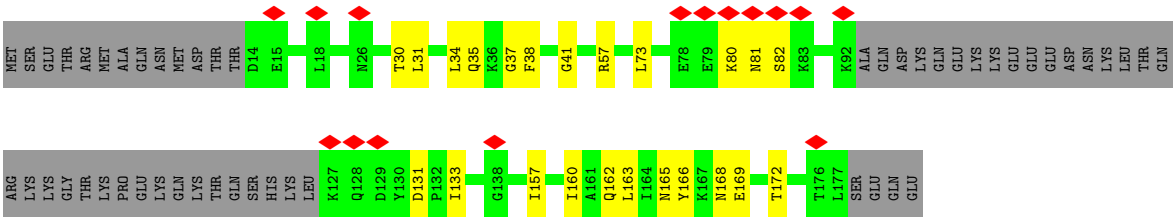
Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
8	o	158	2308	749	1171	177	199	12	0	0

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.

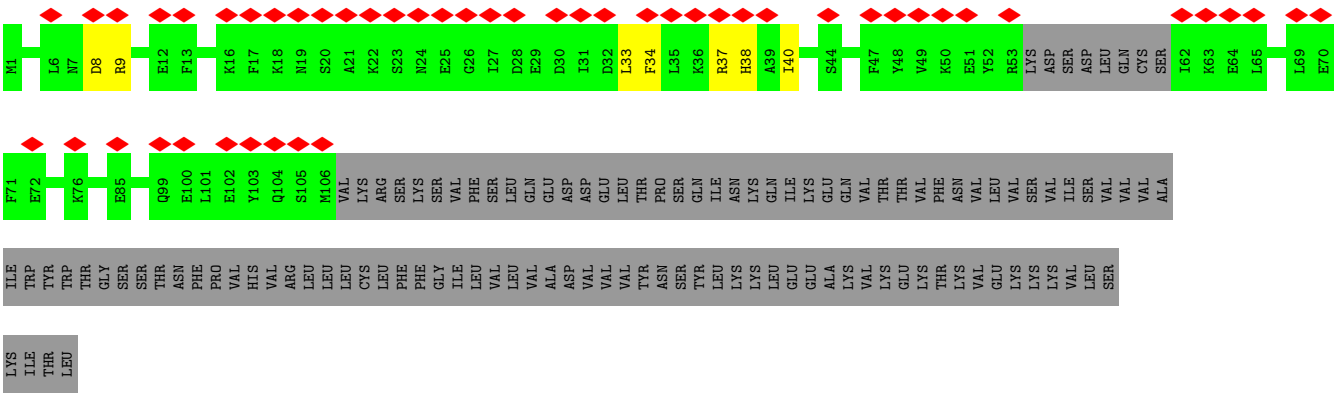
• Molecule 1: Vacuolar ATPase assembly protein VMA22

Chain A:



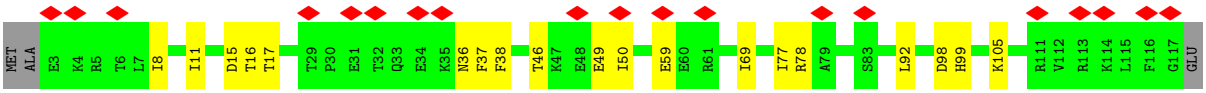
• Molecule 2: Vacuolar ATPase assembly integral membrane protein VPH2

Chain B:



• Molecule 3: V-type proton ATPase subunit F

Chain F:



• Molecule 4: V0 assembly protein 1

Chain b: 17% 83%

MET VAL PHE GLY GLN LEU TYR ALA LEU PHE ILE PHE THR LEU SER CYS CYS ILE SER LYS THR VAL GLN ALA ASP SER SER LYS GLU SER SER SER PHE ILE SER PHE ASP LYS GLU SER ASN TRP ASP THR ILE SER THR ILE SER SER THR ALA ASP VAL ILE SER SER VAL ASP SER

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

LEU PRO GLU SER ALA SER ASP LEU LEU TYR GLU TYR SER LEU ASP ASP LYS SER ILE VAL LEU PHE LYS PHE THR SER ASP ALA TYR ASP LEU LYS LYS LEU ASP GLU PHE ILE ASP SER CYS LEU SER PHE LEU GLU ASP LYS SER GLY ASP ASN LEU THR VAL VAL ILE ASN SER LEU

GLY TRP ALA PHE GLU ASP GLU ASP GLY ASP ASP GLU TYR ALA THR GLU GLU THR LEU SER HIS HIS ASP ASN ASN LYS GLY LYS GLU GLY ASP D212 S257 THR ASN PRO ILE LYS LYS ASN ASN

- Molecule 5: V-type proton ATPase subunit c"

Chain c: 93% 7%

MET ASN LYS GLU SER LYS ASP ASP ASP MET SER LEU GLY LYS PHE S16 Q213

- Molecule 6: V-type proton ATPase subunit d

Chain d: 9% 98%

M1 R21 M110 I111 T112 D117 R118 D119 K120 G121 E122 I123 L124 D134 L139 S140 V141 A142 T143 D144 L145 E146 S147 L148 Y149 E150 T151 V152 D155 K163 ASN CYS PHE ASP THR ALA GLU E171 L172 D173 D174 M175 S230 E263 Y345

- Molecule 7: V-type proton ATPase subunit c

Chain g: 99%

MET T2 D157 V158 V159 CYS

- Molecule 7: V-type proton ATPase subunit c

Chain h: 98%

MET T2 N151 V159 CYS

- Molecule 7: V-type proton ATPase subunit c

Chain i: 99%

MET T2 V159 CYS

- Molecule 7: V-type proton ATPase subunit c

Chain j: 99%

• Molecule 7: V-type proton ATPase subunit c

Chain k: 99%

• Molecule 7: V-type proton ATPase subunit c

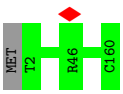
Chain l: 99%

• Molecule 7: V-type proton ATPase subunit c

Chain m: 99%

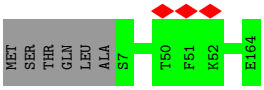
• Molecule 7: V-type proton ATPase subunit c

Chain n: 99%



• Molecule 8: V-type proton ATPase subunit c'

Chain o: 96%



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	114346	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 ($e^-/Å^2$)	45	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	FEI FALCON IV (4k x 4k)	Depositor
Maximum map value	7.727	Depositor
Minimum map value	-4.278	Depositor
Average map value	0.005	Depositor
Map value standard deviation	0.194	Depositor
Recommended contour level	0.9	Depositor
Map size (Å)	329.59998, 329.59998, 329.59998	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.03, 1.03, 1.03	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\|>5$	RMSZ	$\#\|Z\|>5$
1	A	0.28	0/1004	0.46	0/1361
2	B	0.26	0/699	0.42	0/943
3	F	0.25	0/850	0.47	0/1160
4	b	0.24	0/360	0.41	0/491
5	c	0.29	0/1500	0.43	0/2037
6	d	0.29	0/2741	0.46	0/3720
7	g	0.30	0/1150	0.46	0/1564
7	h	0.30	0/1150	0.46	0/1564
7	i	0.29	0/1150	0.45	0/1564
7	j	0.29	0/1150	0.45	0/1564
7	k	0.30	0/1147	0.47	0/1560
7	l	0.29	0/1137	0.45	0/1548
7	m	0.30	0/1155	0.45	0/1569
7	n	0.30	0/1147	0.46	0/1560
8	o	0.31	0/1160	0.45	0/1572
All	All	0.29	0/17500	0.45	0/23777

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	989	925	924	14	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	686	567	566	4	0
3	F	835	763	763	12	0
4	b	355	375	375	0	0
5	c	1470	1538	1538	0	0
6	d	2686	2547	2546	0	0
7	g	1132	1202	1202	0	0
7	h	1132	1202	1202	0	0
7	i	1132	1202	1202	0	0
7	j	1132	1202	1202	0	0
7	k	1129	1200	1200	0	0
7	l	1119	1183	1183	0	0
7	m	1137	1202	1202	0	0
7	n	1129	1184	1184	0	0
8	o	1137	1171	1171	0	0
All	All	17200	17463	17460	29	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 (29) 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:F:98:ASP:OD2	3:F:99:HIS:ND1	2.17	0.77
3:F:46:THR:OG1	3:F:49:GLU:OE1	2.05	0.72
3:F:78:ARG:NH2	3:F:105:LYS:O	2.26	0.69
3:F:59:GLU:N	3:F:59:GLU:OE1	2.27	0.68
1:A:131:ASP:OD2	1:A:133:ILE:HG22	1.96	0.66
1:A:34:LEU:HD22	1:A:163:LEU:HD22	1.77	0.64
1:A:31:LEU:O	1:A:35:GLN:N	2.35	0.60
2:B:8:ASP:OD1	2:B:9:ARG:N	2.39	0.56
3:F:15:ASP:OD1	3:F:16:THR:N	2.39	0.56
1:A:168:ASN:O	1:A:172:THR:HG23	2.09	0.52
3:F:50:ILE:HG22	3:F:77:ILE:HD13	1.93	0.51
3:F:17:THR:HG23	3:F:37:PHE:CD2	2.44	0.51
2:B:34:PHE:O	2:B:38:HIS:N	2.45	0.50
1:A:30:THR:O	1:A:34:LEU:N	2.44	0.47
3:F:11:ILE:HD11	3:F:69:ILE:HD12	1.97	0.46
1:A:162:GLN:O	1:A:166:TYR:HD2	1.98	0.46
2:B:34:PHE:CB	2:B:40:ILE:HD13	2.46	0.46
1:A:34:LEU:HD11	1:A:38:PHE:HE2	1.80	0.46
3:F:8:ILE:O	3:F:36:ASN:ND2	2.47	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:165:ASN:O	1:A:169:GLU:HG3	2.17	0.45
2:B:33:LEU:O	2:B:37:ARG:N	2.46	0.45
1:A:163:LEU:HD23	3:F:92:LEU:HD11	1.99	0.44
3:F:11:ILE:O	3:F:11:ILE:HG13	2.18	0.44
1:A:37:GLY:O	1:A:41:GLY:N	2.44	0.44
1:A:157:ILE:HD13	1:A:160:ILE:HD12	2.01	0.42
1:A:57:ARG:O	1:A:57:ARG:HD2	2.19	0.42
3:F:11:ILE:HG22	3:F:38:PHE:HB3	2.01	0.42
1:A:81:ASN:OD1	1:A:82:SER:N	2.51	0.41
1:A:73:LEU:HD13	1:A:157:ILE:HG21	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	126/181 (70%)	123 (98%)	3 (2%)	0	100	100
2	B	94/215 (44%)	90 (96%)	4 (4%)	0	100	100
3	F	113/118 (96%)	109 (96%)	4 (4%)	0	100	100
4	b	44/265 (17%)	41 (93%)	3 (7%)	0	100	100
5	c	196/213 (92%)	193 (98%)	3 (2%)	0	100	100
6	d	334/345 (97%)	324 (97%)	10 (3%)	0	100	100
7	g	156/160 (98%)	149 (96%)	7 (4%)	0	100	100
7	h	156/160 (98%)	153 (98%)	3 (2%)	0	100	100
7	i	156/160 (98%)	154 (99%)	2 (1%)	0	100	100
7	j	156/160 (98%)	154 (99%)	2 (1%)	0	100	100
7	k	156/160 (98%)	153 (98%)	3 (2%)	0	100	100
7	l	156/160 (98%)	154 (99%)	2 (1%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
7	m	157/160 (98%)	152 (97%)	5 (3%)	0	100	100
7	n	157/160 (98%)	154 (98%)	3 (2%)	0	100	100
8	o	156/164 (95%)	147 (94%)	9 (6%)	0	100	100
All	All	2313/2781 (83%)	2250 (97%)	63 (3%)	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	100/168 (60%)	99 (99%)	1 (1%)	76	90
2	B	49/205 (24%)	49 (100%)	0	100	100
3	F	77/104 (74%)	77 (100%)	0	100	100
4	b	41/244 (17%)	41 (100%)	0	100	100
5	c	153/168 (91%)	153 (100%)	0	100	100
6	d	286/309 (93%)	285 (100%)	1 (0%)	92	96
7	g	117/119 (98%)	117 (100%)	0	100	100
7	h	117/119 (98%)	116 (99%)	1 (1%)	78	91
7	i	117/119 (98%)	117 (100%)	0	100	100
7	j	117/119 (98%)	117 (100%)	0	100	100
7	k	116/119 (98%)	116 (100%)	0	100	100
7	l	114/119 (96%)	114 (100%)	0	100	100
7	m	117/119 (98%)	117 (100%)	0	100	100
7	n	115/119 (97%)	115 (100%)	0	100	100
8	o	117/125 (94%)	117 (100%)	0	100	100
All	All	1753/2275 (77%)	1750 (100%)	3 (0%)	93	97

All (3) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	80	LYS
6	d	21	ARG
7	h	151	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
3	F	56	HIS
3	F	72	HIS

5.3.3 RNA (i)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

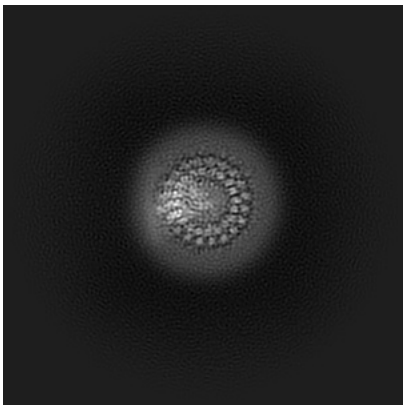
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-27985. These allow visual inspection of the internal detail of the map and identification of artifacts.

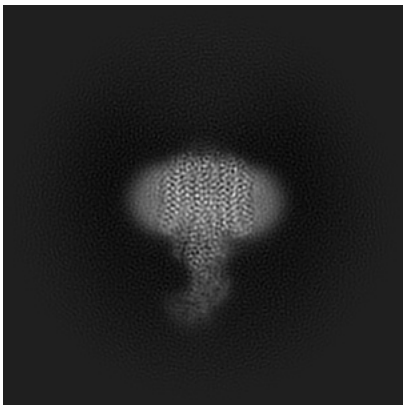
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections (i)

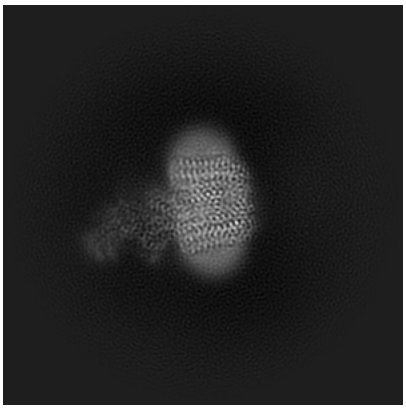
6.1.1 Primary map



X

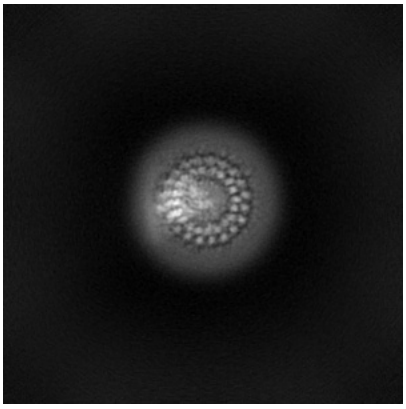


Y

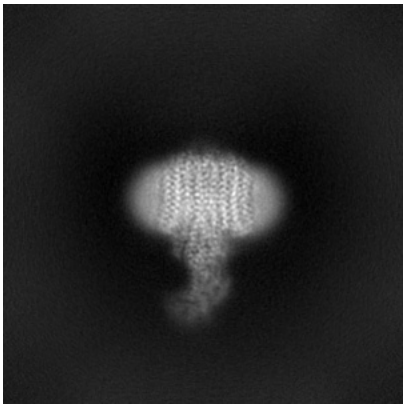


Z

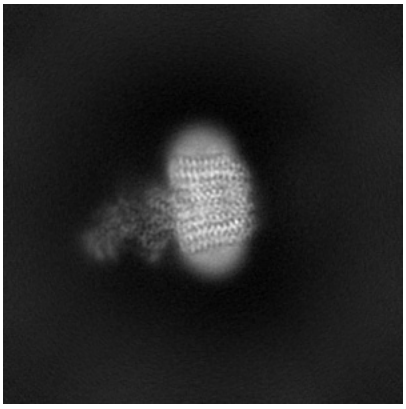
6.1.2 Raw map



X



Y

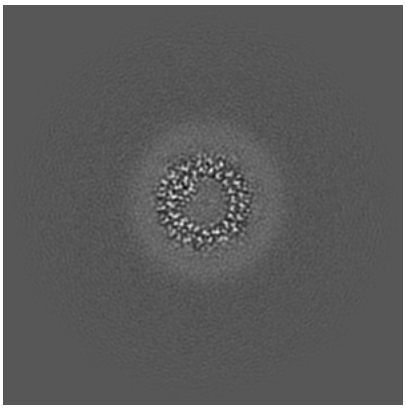


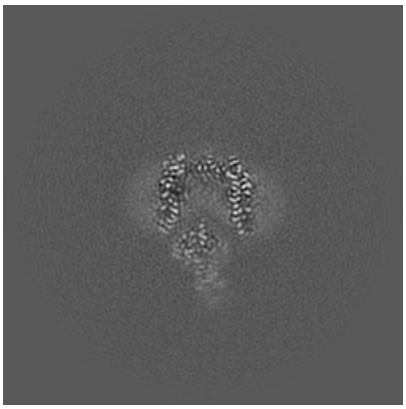
Z

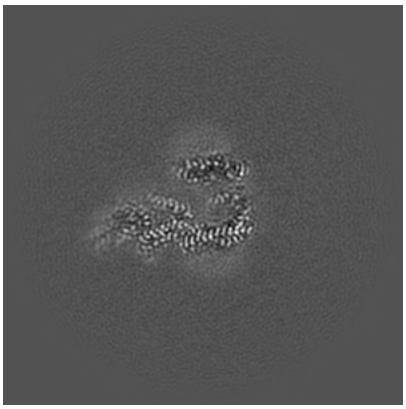
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

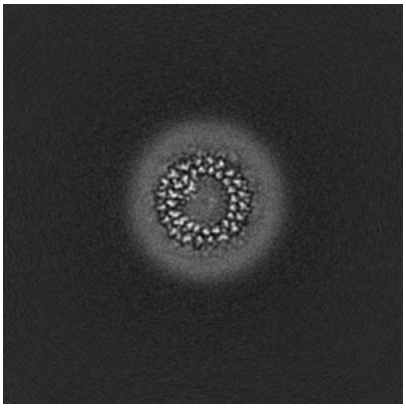
6.2.1 Primary map

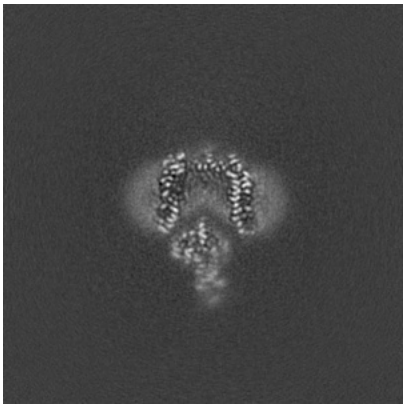

X Index: 160

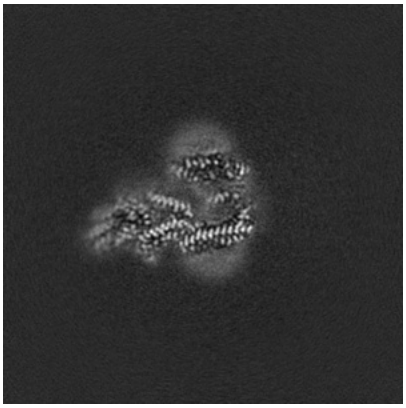

Y Index: 160


Z Index: 160

6.2.2 Raw map


X Index: 160

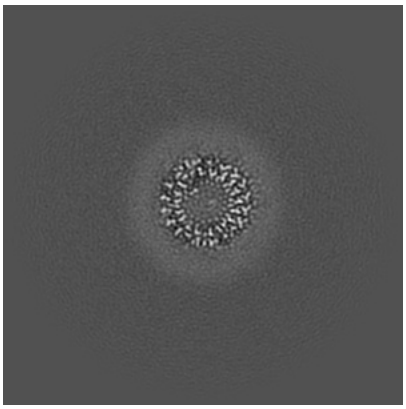

Y Index: 160

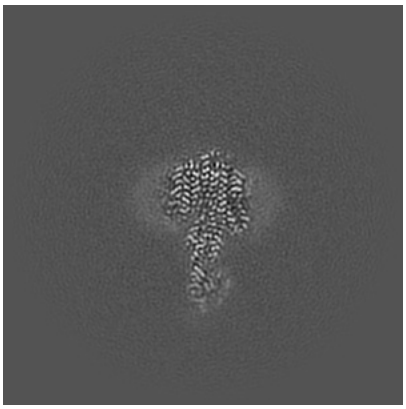

Z Index: 160

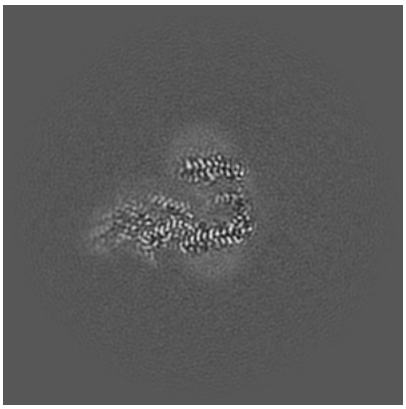
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

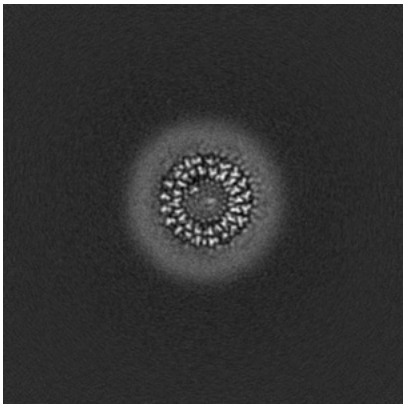
6.3.1 Primary map

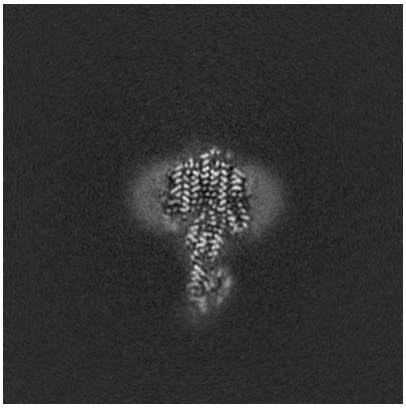

X Index: 167

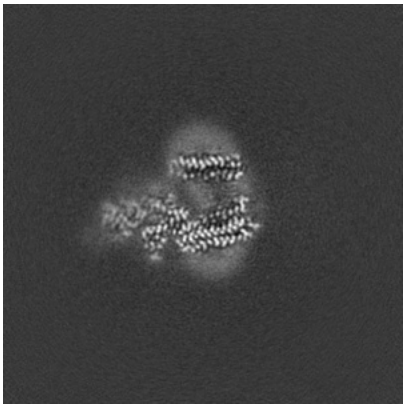

Y Index: 141


Z Index: 159

6.3.2 Raw map


X Index: 167

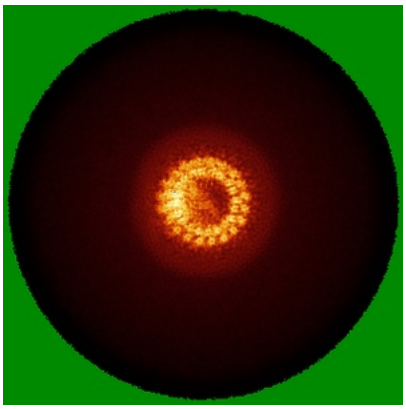

Y Index: 141

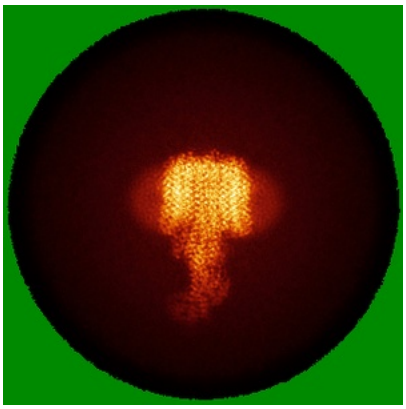

Z Index: 168

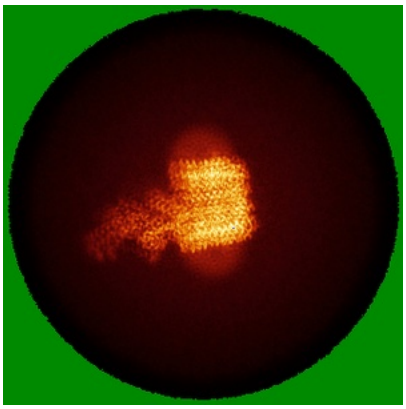
The images above show the largest variance slices of the map in three orthogonal directions.

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

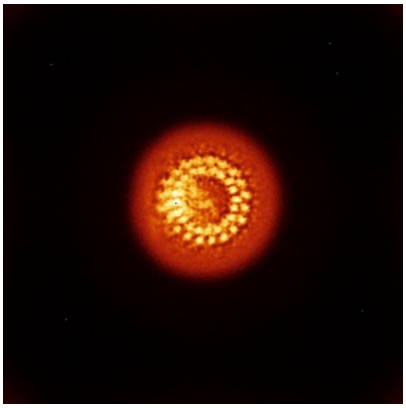
6.4.1 Primary map

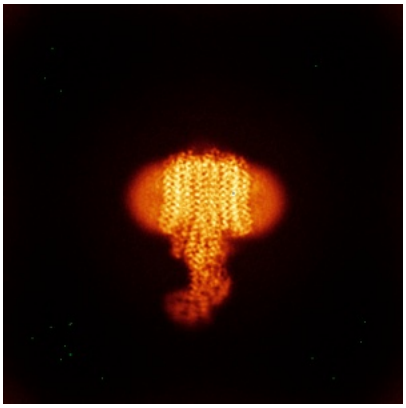

X

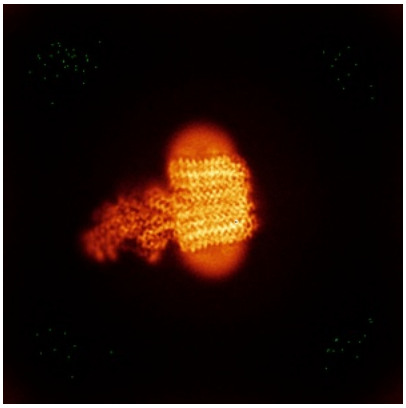

Y


Z

6.4.2 Raw map


X


Y


Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.9. 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.

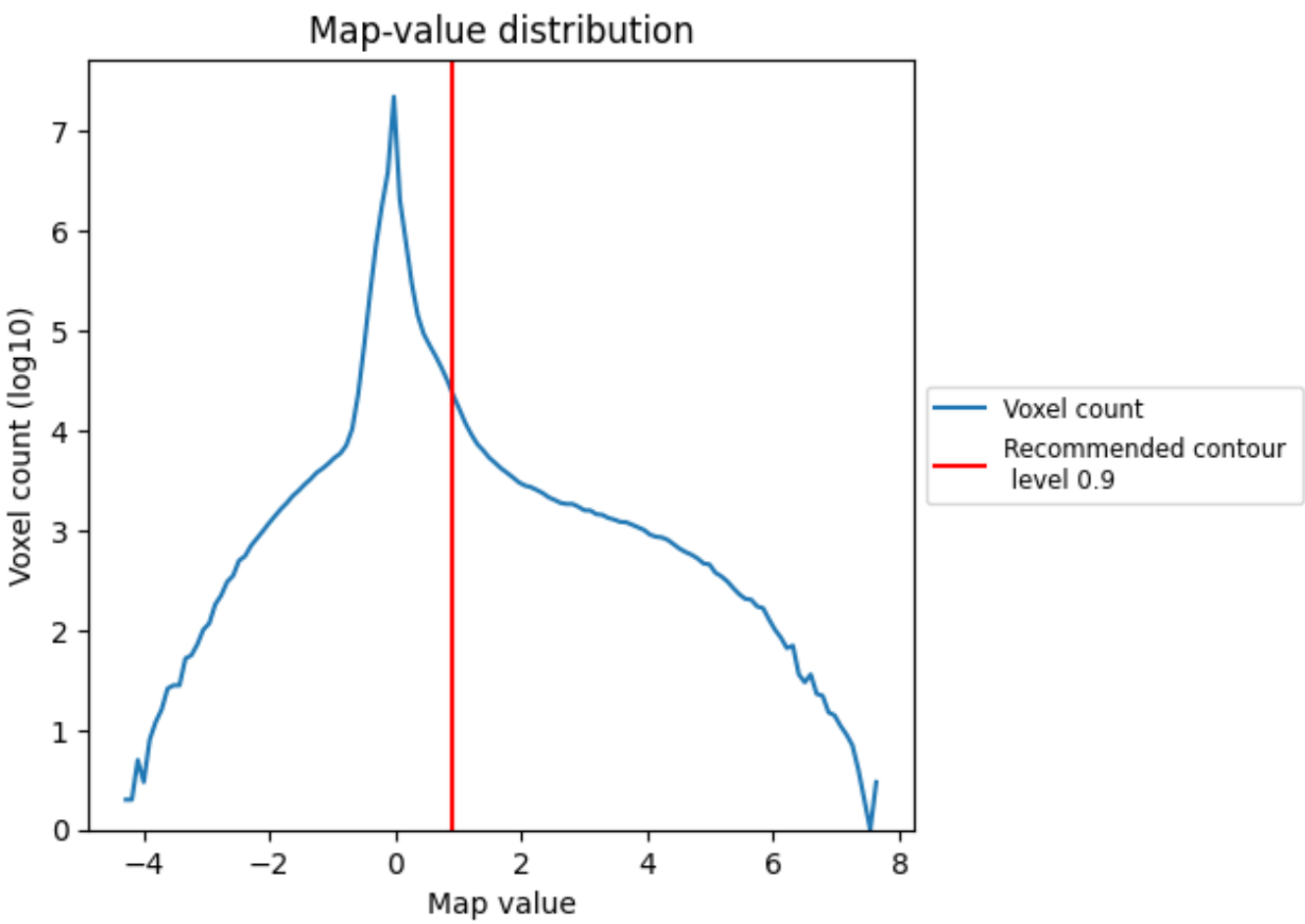
6.6 Mask visualisation (i)

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

7 Map analysis (i)

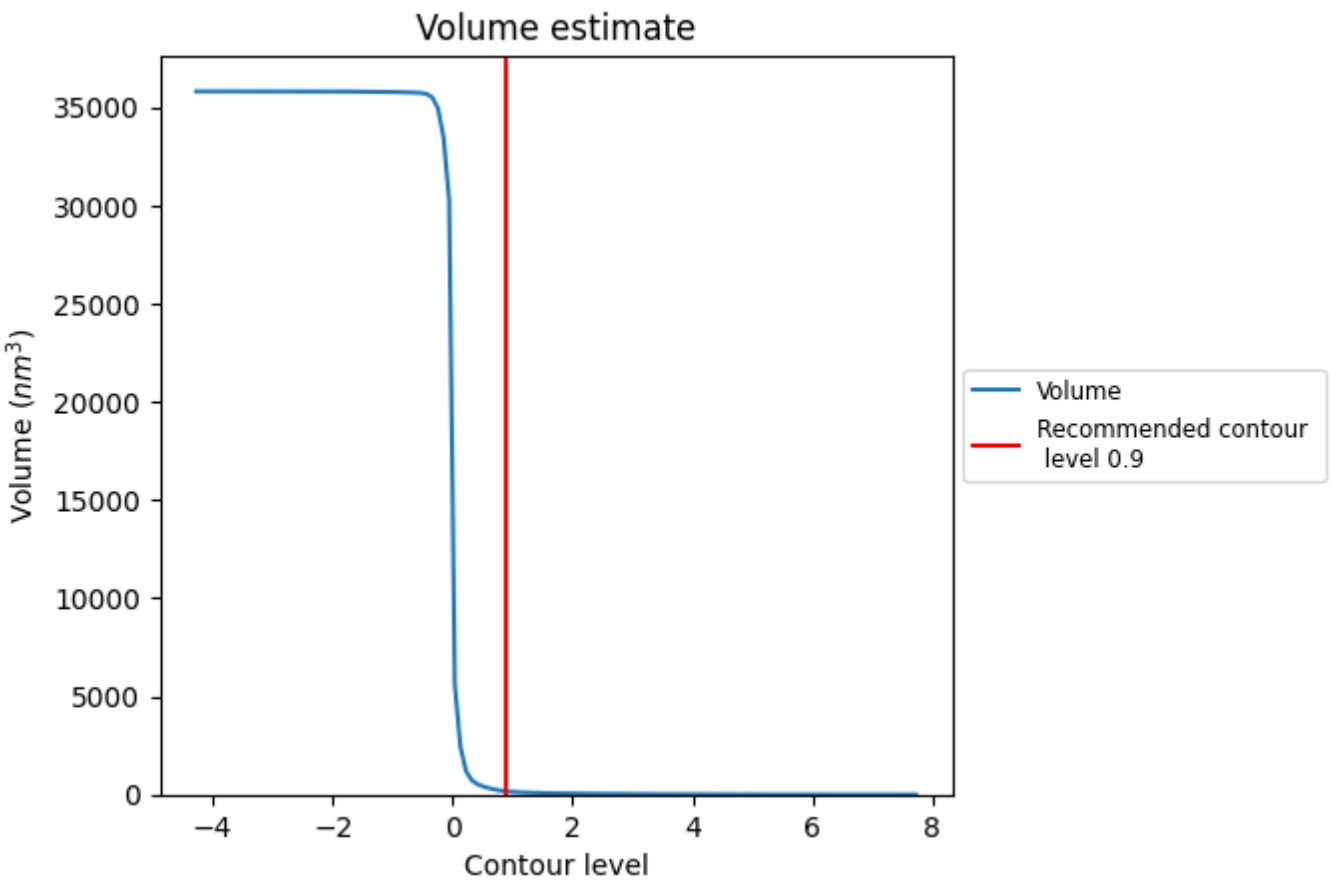
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution (i)



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

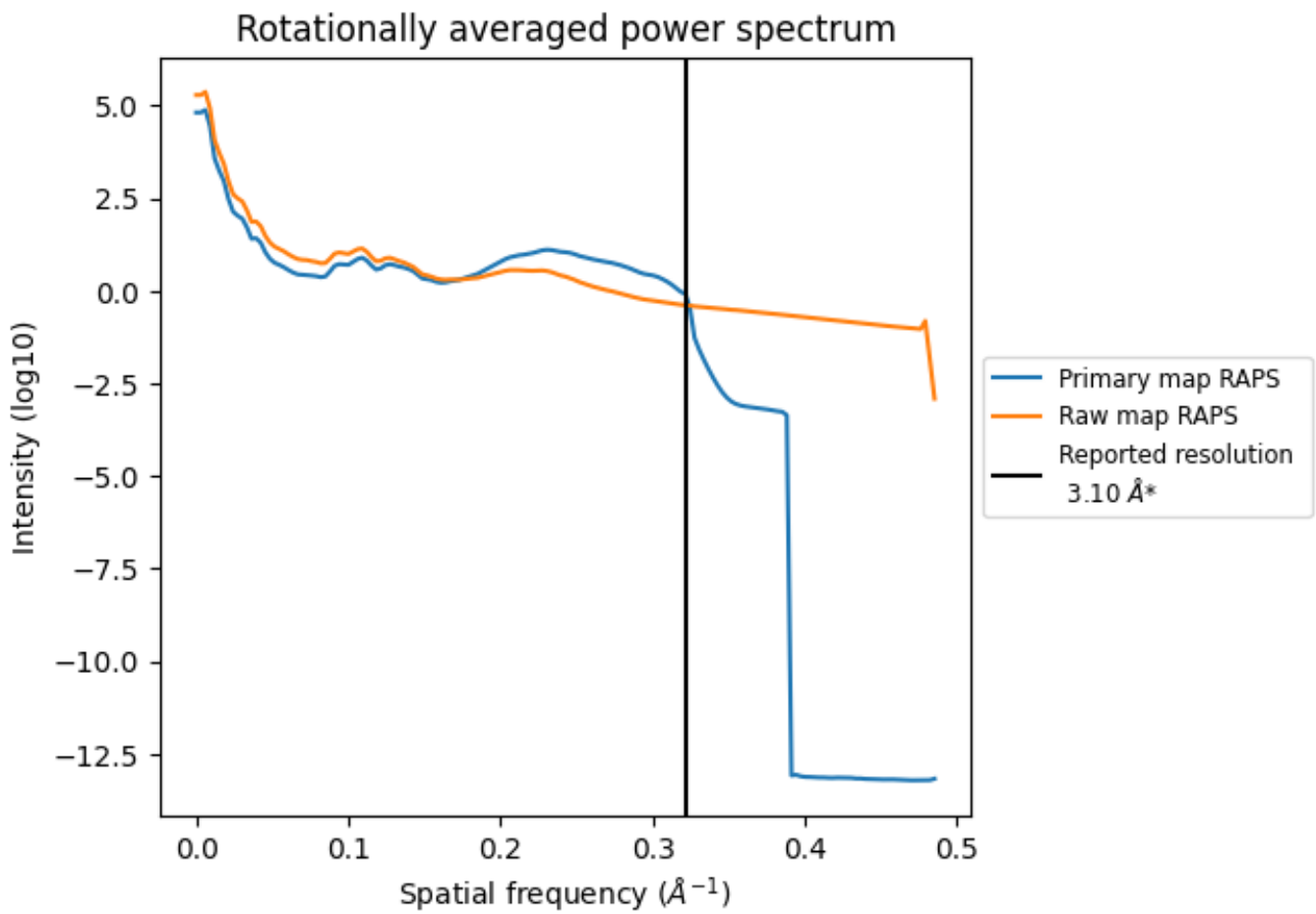
7.2 Volume estimate (i)



The volume at the recommended contour level is 166 nm^3; this corresponds to an approximate mass of 150 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)

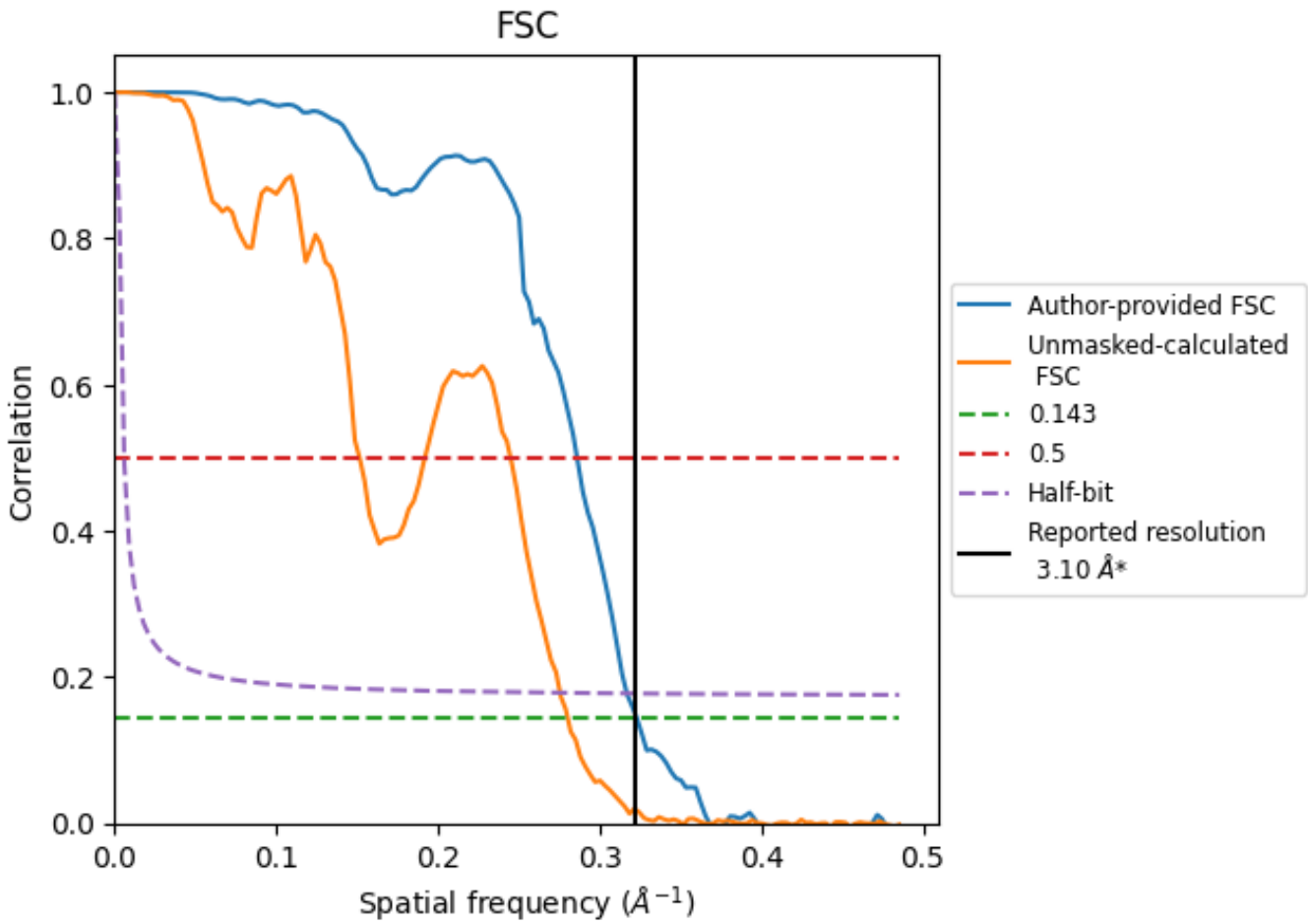


*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

8 Fourier-Shell correlation (i)

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

8.1 FSC (i)



*Reported resolution corresponds to spatial frequency of 0.323 Å^{-1}

8.2 Resolution estimates (i)

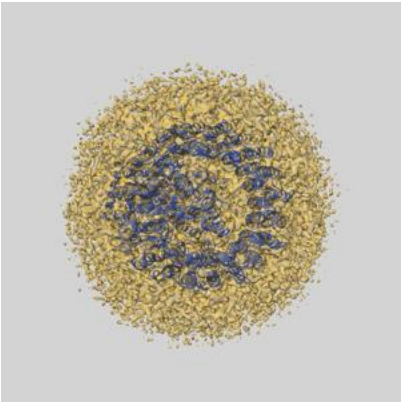
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.10	-	-
Author-provided FSC curve	3.09	3.50	3.16
Unmasked-calculated*	3.57	6.60	3.63

*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 3.57 differs from the reported value 3.1 by more than 10 %

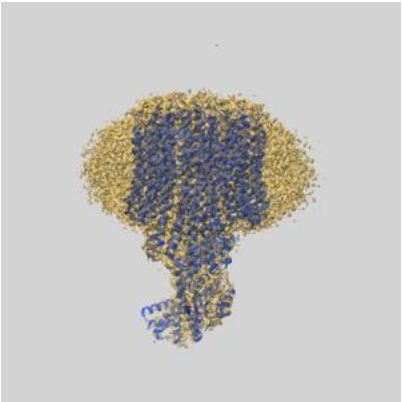
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-27985 and PDB model 8EAT. Per-residue inclusion information can be found in section 3 on page 6.

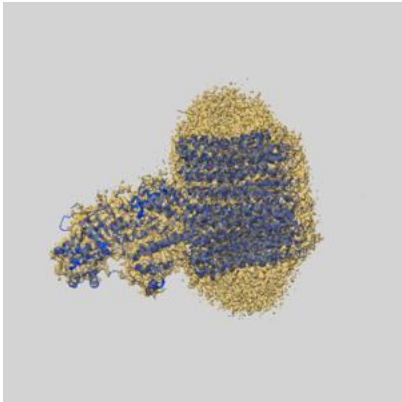
9.1 Map-model overlay (i)



X



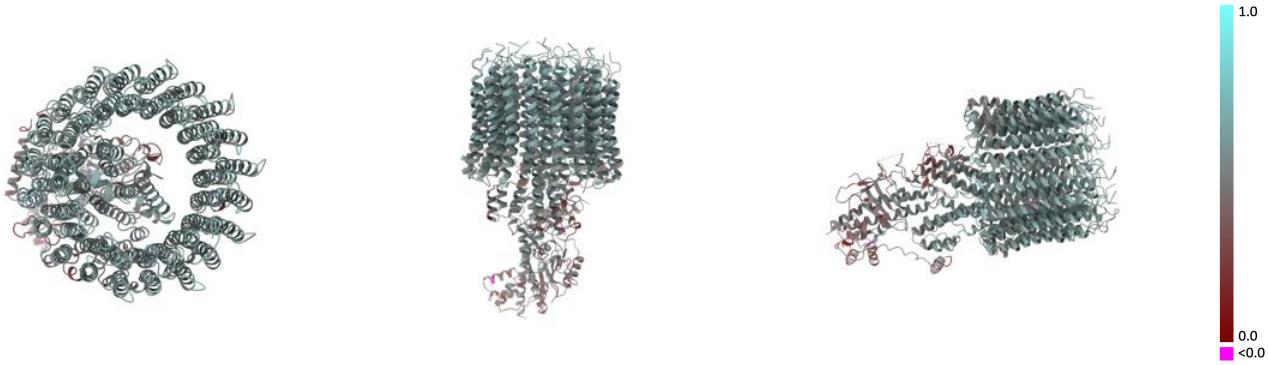
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.9 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.

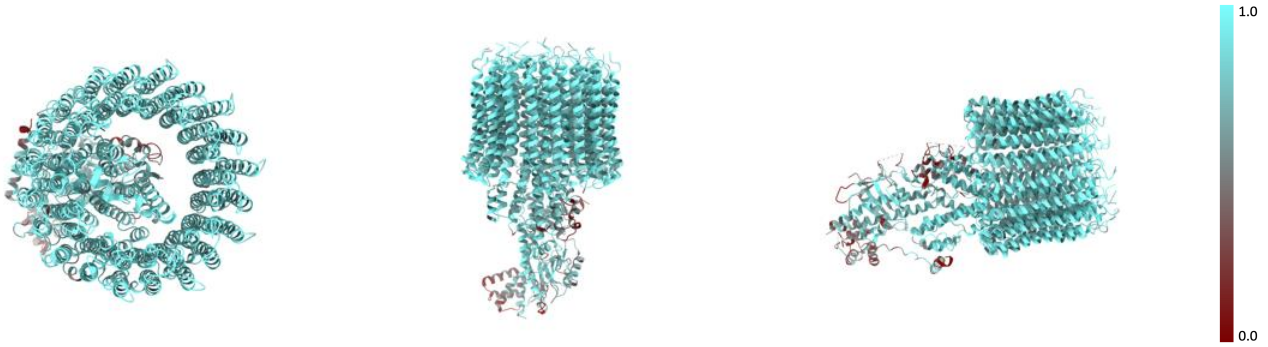
9.2 Q-score mapped to coordinate model (i)



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.

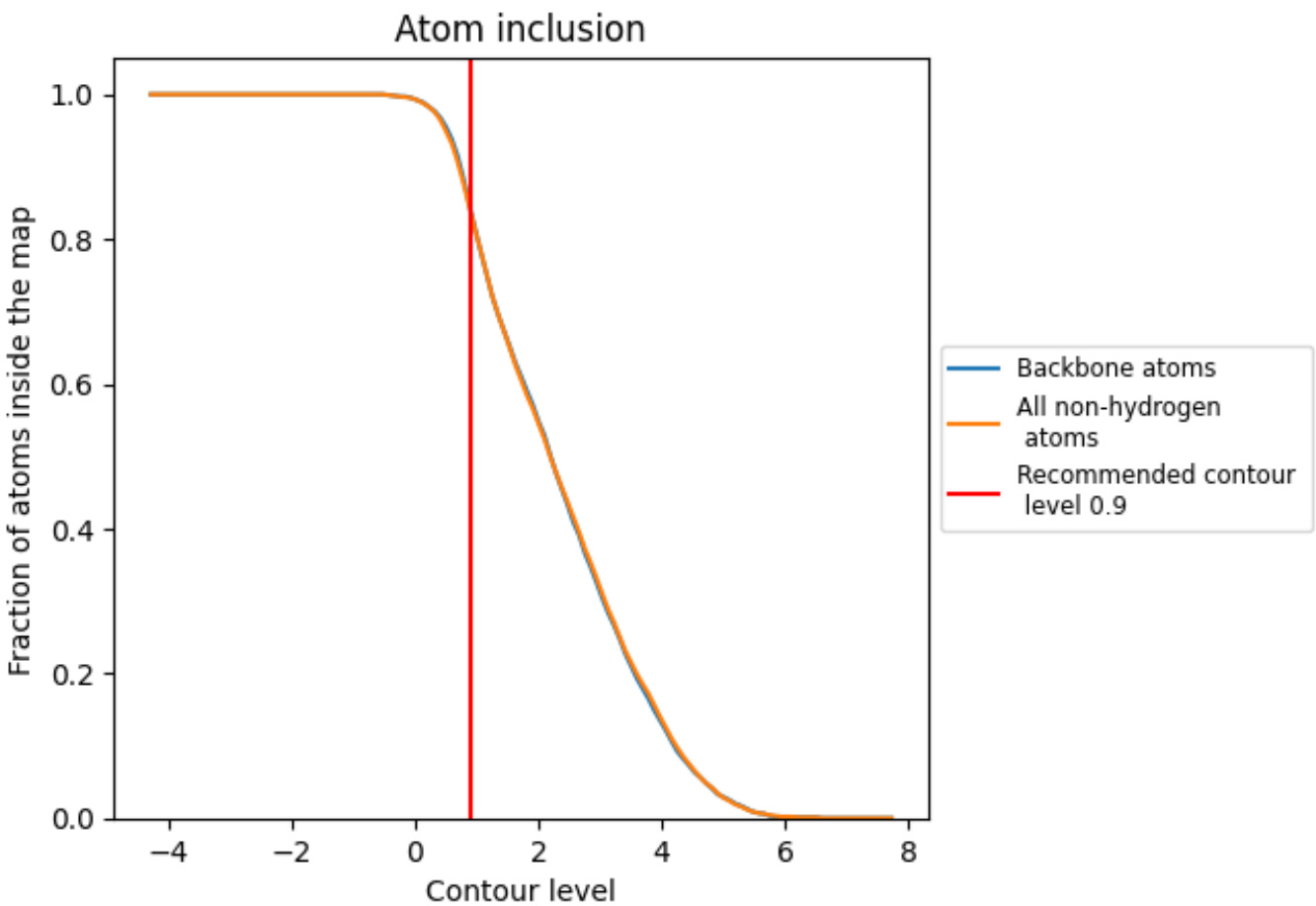
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.9).

9.4 Atom inclusion (i)



At the recommended contour level, 84% of all backbone atoms, 84% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.9) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8390	0.5290
A	0.7340	0.4680
B	0.4370	0.3530
F	0.7150	0.4470
b	0.8640	0.5600
c	0.8990	0.5640
d	0.8090	0.5070
g	0.9010	0.5620
h	0.9010	0.5620
i	0.9020	0.5620
j	0.8850	0.5480
k	0.8800	0.5500
l	0.8980	0.5570
m	0.9010	0.5590
n	0.8740	0.5390
o	0.8770	0.5390