Full wwPDB EM Validation Report ⓘ

Nov 16, 2026 – 05:07 pm GMT

PDB ID	:	9T96 / pdb_00009t96
EMDB ID	:	EMD-55717
Title	:	cryo-EM structure of (AccA3)4/AccE5 complex from Mycobacterium smegmatis
Authors	:	Mullapudi, E.; Thai, H.M.; de Carvalho, L.P.S.; Wilmanns, M.
Deposited on	:	2025-11-14
Resolution	:	3.30 Å(reported)
Based on initial model	:	.

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

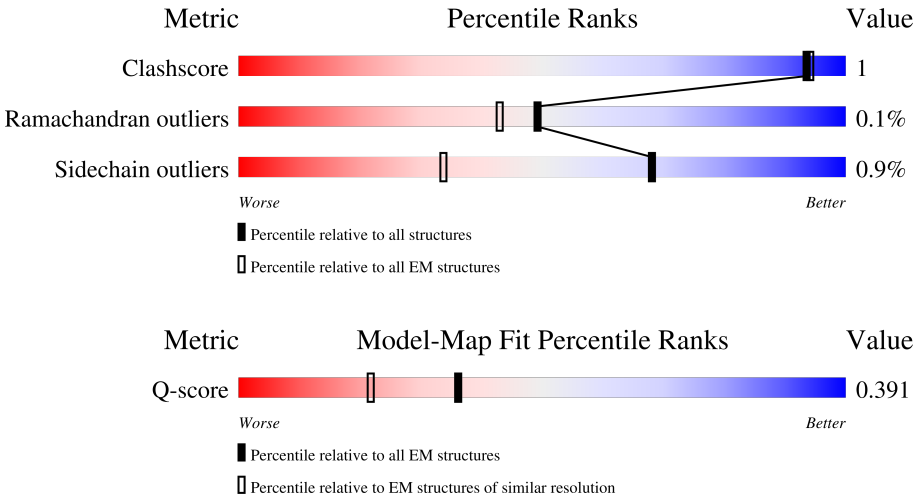
EMDB validation analysis	:	0.0.1.dev133
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4-5-2 with Phenix2.2
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.51

1 Overall quality at a glance

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

The reported resolution of this entry is 3.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	15087 (2.80 - 3.80)

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	A3a	598	88% 6% 6%
1	A3b	598	79% 19%
1	A3c	598	79% 19%
1	A3d	598	77% 20%

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Mol	Chain	Length	Quality of chain
2	E5a	94	29% 71%

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 15386 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.

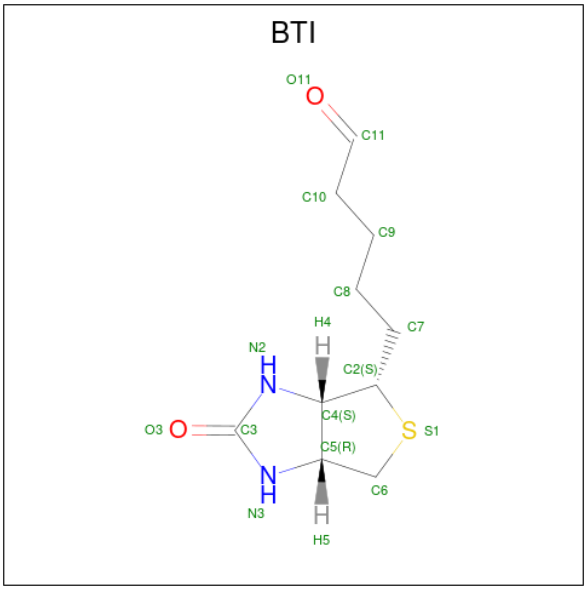
- Molecule 1 is a protein called Biotin-dependent acyl-coenzyme A carboxylase alpha3 subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A3c	483	Total	C	N	O	S	0	0
			3666	2304	649	707	6		
1	A3b	487	Total	C	N	O	S	0	0
			3696	2324	654	712	6		
1	A3d	476	Total	C	N	O	S	0	0
			3613	2274	643	690	6		
1	A3a	561	Total	C	N	O	S	0	0
			4208	2641	739	819	9		

- Molecule 2 is a protein called Acetyl-/propionyl-coenzyme A carboxylase AccE5.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	E5a	27	Total	C	N	O	S	0	0
			188	118	33	35	2		

- Molecule 3 is 5-(HEXAHYDRO-2-OXO-1H-THIENO[3,4-D]IMIDAZOL-6-YL)PENTANAL (CCD ID: BTI) (formula: $C_{10}H_{16}N_2O_2S$) (labeled as "Ligand of Interest" by depositor).



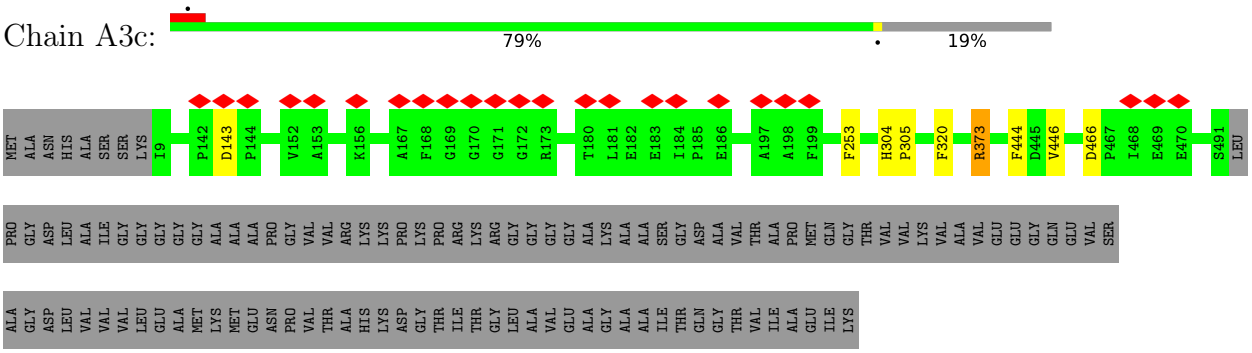
Mol	Chain	Residues	Atoms					AltConf
3	A3a	1	Total	C	N	O	S	0
			15	10	2	2	1	

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.

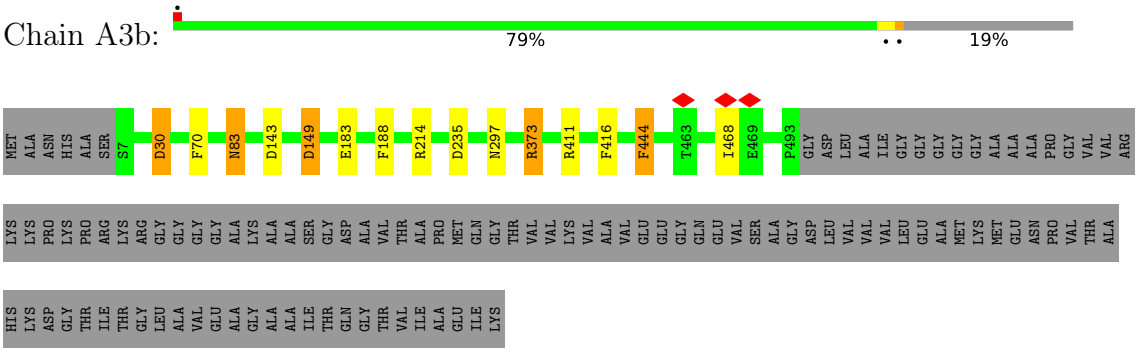
• Molecule 1: Biotin-dependent acyl-coenzyme A carboxylase alpha3 subunit

Chain A3c:



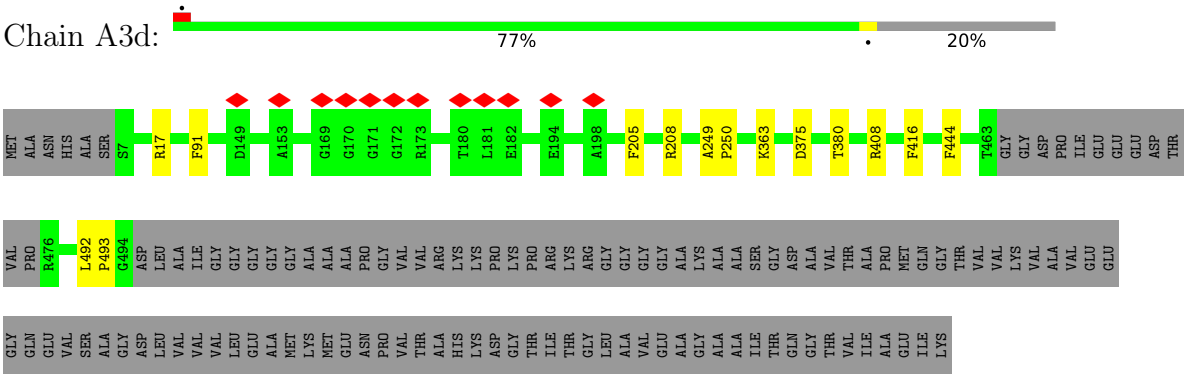
• Molecule 1: Biotin-dependent acyl-coenzyme A carboxylase alpha3 subunit

Chain A3b:



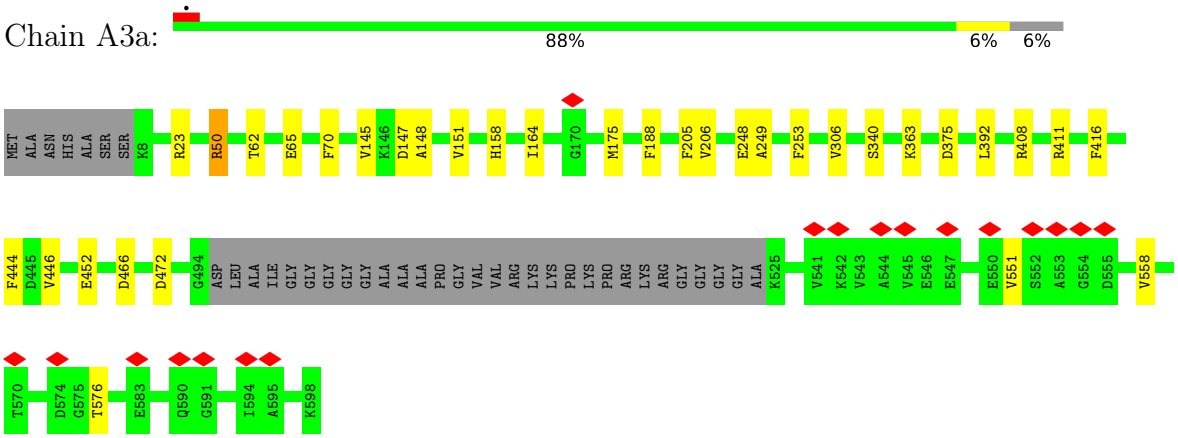
• Molecule 1: Biotin-dependent acyl-coenzyme A carboxylase alpha3 subunit

Chain A3d:



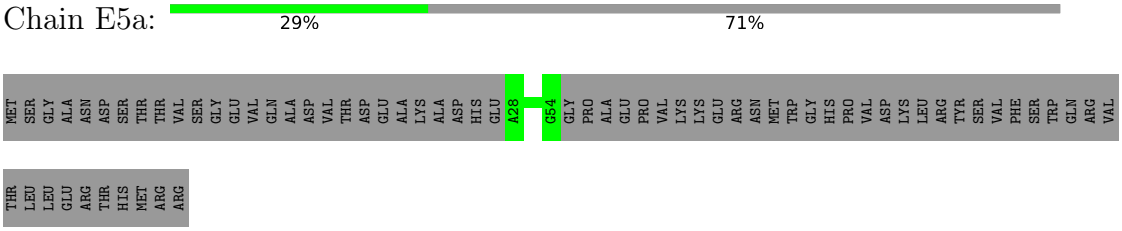
• Molecule 1: Biotin-dependent acyl-coenzyme A carboxylase alpha3 subunit

Chain A3a:



• Molecule 2: Acetyl-/propionyl-coenzyme A carboxylase AccE5

Chain E5a:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	251974	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	44.4	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2250	Depositor
Magnification	130000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.288	Depositor
Minimum map value	-0.144	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.007	Depositor
Recommended contour level	0.03	Depositor
Map size (Å)	380.80002, 380.80002, 380.80002	wwPDB
Map dimensions	560, 560, 560	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.68, 0.68, 0.68	Depositor

5 Model quality

5.1 Standard geometry

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

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	A3a	0.77	1/4285 (0.0%)	1.18	11/5815 (0.2%)
1	A3b	0.75	0/3771	1.17	11/5119 (0.2%)
1	A3c	0.68	0/3740	1.11	3/5077 (0.1%)
1	A3d	0.67	0/3685	1.11	4/4998 (0.1%)
2	E5a	0.61	0/190	1.00	0/256
All	All	0.72	1/15671 (0.0%)	1.14	29/21265 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A3a	0	1
1	A3b	0	2
1	A3c	0	1
1	A3d	0	3
All	All	0	7

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A3a	340	SER	CA-CB	-6.18	1.43	1.53

All (29) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A3a	23	ARG	NE-CZ-NH1	-7.11	114.39	121.50
1	A3d	91	PHE	CA-CB-CG	6.58	120.38	113.80
1	A3a	205	PHE	CA-CB-CG	6.47	120.27	113.80

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A3b	411	ARG	NE-CZ-NH1	-6.22	115.28	121.50
1	A3a	70	PHE	CA-CB-CG	6.12	119.92	113.80
1	A3c	143	ASP	CA-CB-CG	5.98	118.58	112.60
1	A3b	373	ARG	NE-CZ-NH2	5.97	124.57	119.20
1	A3b	70	PHE	CA-CB-CG	5.88	119.67	113.80
1	A3a	375	ASP	CA-CB-CG	5.80	118.40	112.60
1	A3a	408	ARG	NE-CZ-NH2	5.78	124.40	119.20
1	A3b	83	ASN	CA-CB-CG	5.72	118.32	112.60
1	A3d	375	ASP	CA-CB-CG	5.71	118.31	112.60
1	A3a	248	GLU	N-CA-CB	-5.57	101.16	111.52
1	A3a	466	ASP	CA-CB-CG	5.53	118.12	112.60
1	A3b	149	ASP	CA-CB-CG	5.38	117.98	112.60
1	A3b	143	ASP	CA-CB-CG	5.38	117.98	112.60
1	A3c	466	ASP	CA-CB-CG	5.37	117.97	112.60
1	A3b	444	PHE	CA-CB-CG	5.36	119.16	113.80
1	A3a	50	ARG	NE-CZ-NH1	-5.32	116.18	121.50
1	A3a	472	ASP	CA-CB-CG	5.28	117.88	112.60
1	A3b	235	ASP	CA-CB-CG	5.26	117.86	112.60
1	A3a	576	THR	CA-C-N	5.20	127.67	120.49
1	A3a	576	THR	C-N-CA	5.20	127.67	120.49
1	A3b	183	GLU	CA-C-N	5.20	123.51	120.24
1	A3b	183	GLU	C-N-CA	5.20	123.51	120.24
1	A3b	30	ASP	CA-CB-CG	5.18	117.78	112.60
1	A3c	320	PHE	CA-CB-CG	5.08	118.89	113.80
1	A3d	205	PHE	CA-CB-CG	5.08	118.88	113.80
1	A3d	444	PHE	CA-CB-CG	5.03	118.83	113.80

There are no chirality outliers.

All (7) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A3a	50	ARG	Sidechain
1	A3b	214	ARG	Sidechain
1	A3b	373	ARG	Sidechain
1	A3c	373	ARG	Sidechain
1	A3d	17	ARG	Sidechain
1	A3d	208	ARG	Sidechain
1	A3d	408	ARG	Sidechain

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	A3a	4208	0	4173	23	0
1	A3b	3696	0	3646	1	0
1	A3c	3666	0	3610	14	0
1	A3d	3613	0	3575	4	0
2	E5a	188	0	195	0	0
3	A3a	15	0	16	0	0
All	All	15386	0	15215	41	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 1.

All (41) 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:A3c:253:PHE:CD2	1:A3c:444:PHE:HD2	1.64	1.12
1:A3c:253:PHE:HD2	1:A3c:444:PHE:CD2	1.75	1.03
1:A3c:253:PHE:CD2	1:A3c:444:PHE:CD2	2.48	1.02
1:A3a:253:PHE:CE2	1:A3a:444:PHE:HD2	1.77	1.01
1:A3a:253:PHE:HE2	1:A3a:444:PHE:HD2	1.17	0.89
1:A3a:253:PHE:CE2	1:A3a:444:PHE:CD2	2.63	0.87
1:A3c:444:PHE:HD1	1:A3c:446:VAL:HG22	1.40	0.86
1:A3a:253:PHE:HE2	1:A3a:444:PHE:CD2	1.96	0.80
1:A3c:444:PHE:CD1	1:A3c:446:VAL:CG2	2.67	0.78
1:A3c:444:PHE:HD1	1:A3c:446:VAL:CG2	1.99	0.76
1:A3c:444:PHE:CE1	1:A3c:446:VAL:HG23	2.21	0.75
1:A3c:444:PHE:CD1	1:A3c:446:VAL:HG22	2.26	0.65
1:A3c:253:PHE:HD2	1:A3c:444:PHE:CE2	2.16	0.64
1:A3c:444:PHE:CD1	1:A3c:446:VAL:HG23	2.32	0.63
1:A3a:62:THR:OG1	1:A3a:65:GLU:OE1	2.17	0.61
1:A3a:253:PHE:CD2	1:A3a:444:PHE:CD2	2.88	0.61
1:A3a:145:VAL:HG11	1:A3a:151:VAL:HG12	1.83	0.60
1:A3a:145:VAL:HG11	1:A3a:151:VAL:CG1	2.31	0.60
1:A3a:148:ALA:HA	1:A3a:151:VAL:HG22	1.86	0.57
1:A3c:444:PHE:HE1	1:A3c:446:VAL:HG23	1.68	0.56
1:A3a:444:PHE:CD1	1:A3a:446:VAL:HG22	2.40	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A3a:148:ALA:HA	1:A3a:151:VAL:CG2	2.36	0.55
1:A3a:444:PHE:HD1	1:A3a:446:VAL:HG22	1.72	0.54
1:A3c:253:PHE:CE2	1:A3c:444:PHE:CD2	2.96	0.53
1:A3d:249:ALA:HB1	1:A3d:250:PRO:HD2	1.92	0.52
1:A3a:164:ILE:HD13	1:A3a:206:VAL:CG2	2.42	0.50
1:A3a:147:ASP:O	1:A3a:151:VAL:HG22	2.14	0.48
1:A3a:253:PHE:CD2	1:A3a:444:PHE:HD2	2.22	0.48
1:A3a:164:ILE:HD13	1:A3a:206:VAL:HG23	1.98	0.47
1:A3d:249:ALA:HB1	1:A3d:250:PRO:CD	2.45	0.46
1:A3a:249:ALA:HB3	1:A3a:306:VAL:HG12	1.99	0.43
1:A3a:253:PHE:CD2	1:A3a:444:PHE:CE2	3.06	0.43
1:A3a:253:PHE:HD2	1:A3a:444:PHE:CE2	2.36	0.42
1:A3a:145:VAL:CG1	1:A3a:151:VAL:HG13	2.50	0.42
1:A3d:363:LYS:HA	1:A3d:380:THR:HG22	2.01	0.42
1:A3a:551:VAL:O	1:A3a:551:VAL:HG22	2.20	0.42
1:A3c:304:HIS:N	1:A3c:305:PRO:HD2	2.35	0.41
1:A3d:492:LEU:HB3	1:A3d:493:PRO:CD	2.50	0.41
1:A3c:253:PHE:CE2	1:A3c:444:PHE:HD2	2.25	0.41
1:A3b:30:ASP:OD1	1:A3a:411:ARG:HD3	2.21	0.41
1:A3a:145:VAL:CG1	1:A3a:151:VAL:CG1	2.97	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	A3a	557/598 (93%)	532 (96%)	24 (4%)	1 (0%)	43	71
1	A3b	485/598 (81%)	462 (95%)	22 (4%)	1 (0%)	43	71
1	A3c	481/598 (80%)	466 (97%)	15 (3%)	0	100	100
1	A3d	472/598 (79%)	455 (96%)	17 (4%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
2	E5a	25/94 (27%)	25 (100%)	0	0	100 100
All	All	2020/2486 (81%)	1940 (96%)	78 (4%)	2 (0%)	49 75

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A3b	468	ILE
1	A3a	558	VAL

5.3.2 Protein sidechains

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
1	A3a	433/453 (96%)	426 (98%)	7 (2%)	55 72
1	A3b	381/453 (84%)	375 (98%)	6 (2%)	55 72
1	A3c	377/453 (83%)	376 (100%)	1 (0%)	86 86
1	A3d	371/453 (82%)	370 (100%)	1 (0%)	86 86
2	E5a	18/76 (24%)	18 (100%)	0	100 100
All	All	1580/1888 (84%)	1565 (99%)	15 (1%)	68 78

All (15) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A3c	373	ARG
1	A3b	83	ASN
1	A3b	149	ASP
1	A3b	188	PHE
1	A3b	297	ASN
1	A3b	416	PHE
1	A3b	444	PHE
1	A3d	416	PHE
1	A3a	158	HIS
1	A3a	175	MET

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Mol	Chain	Res	Type
1	A3a	188	PHE
1	A3a	363	LYS
1	A3a	392	LEU
1	A3a	416	PHE
1	A3a	452	GLU

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

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 oligosaccharides in this entry.

5.6 Ligand geometry (i)

1 ligand is 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	BTI	A3a	1001	-	16,16,16	0.71	0	21,21,21	1.36	3 (14%)

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	BTI	A3a	1001	-	-	3/5/27/27	0/2/2/2

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	A3a	1001	BTI	C6-S1-C2	-3.34	83.02	89.89
3	A3a	1001	BTI	C2-C4-C5	-3.09	105.35	108.94
3	A3a	1001	BTI	C2-C4-N2	2.04	114.96	113.13

There are no chirality outliers.

All (3) torsion outliers are listed below:

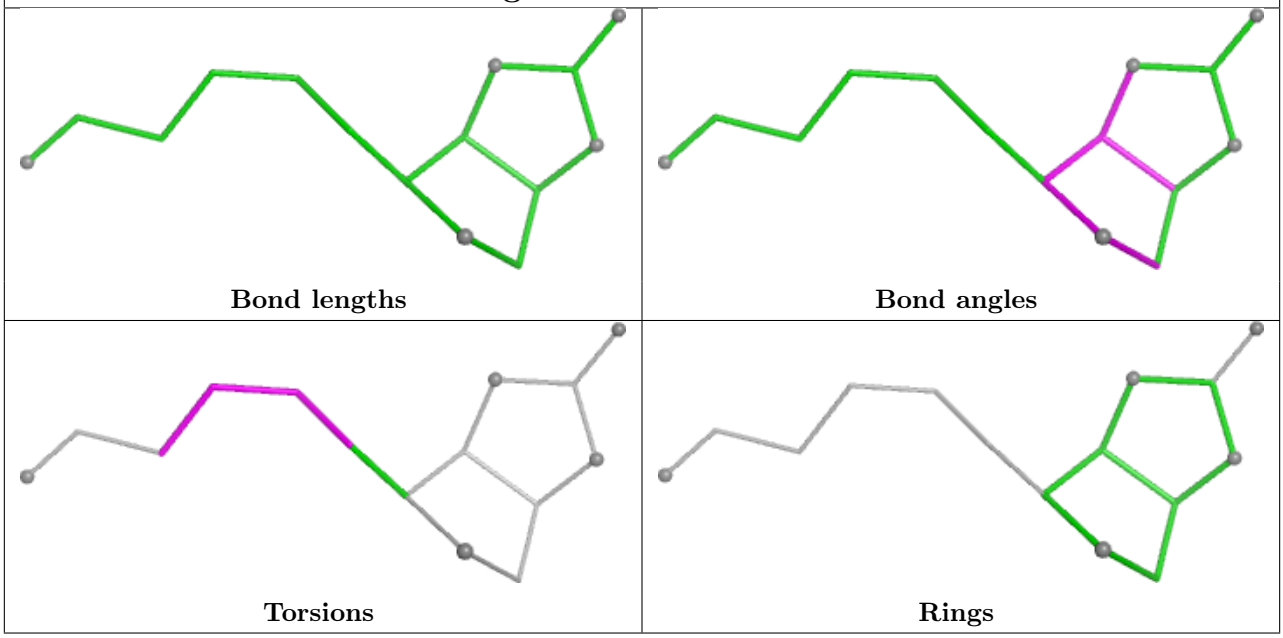
Mol	Chain	Res	Type	Atoms
3	A3a	1001	BTI	C2-C7-C8-C9
3	A3a	1001	BTI	C11-C10-C9-C8
3	A3a	1001	BTI	C7-C8-C9-C10

There are no ring outliers.

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand BTI A3a 1001



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.

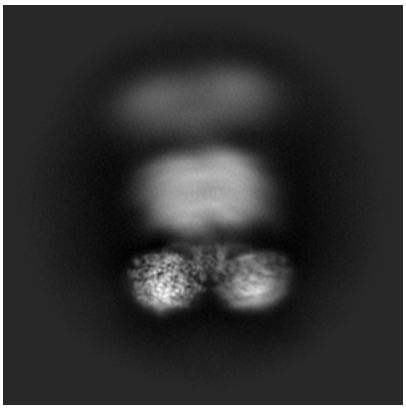
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-55717. These allow visual inspection of the internal detail of the map and identification of artifacts.

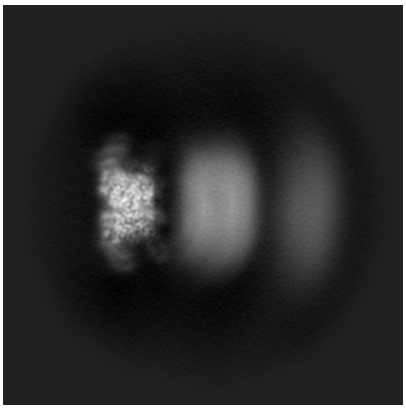
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

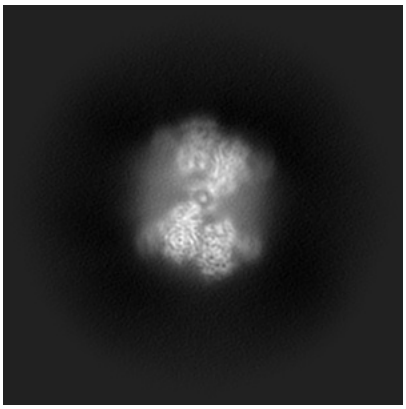
6.1.1 Primary map



X

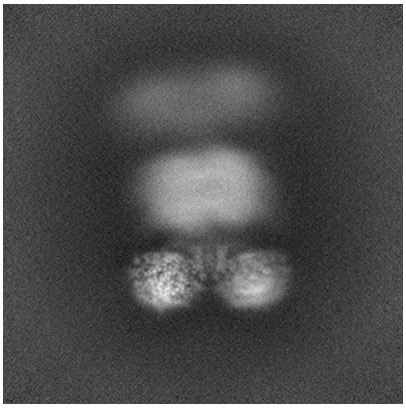


Y

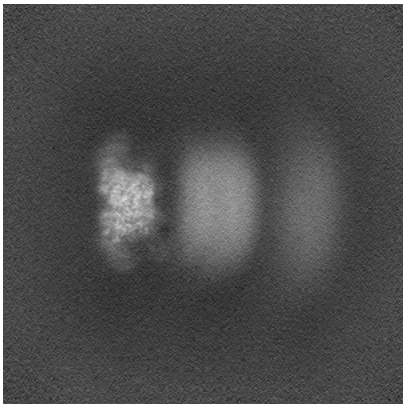


Z

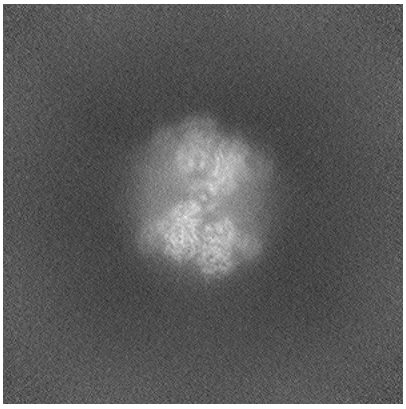
6.1.2 Raw map



X



Y

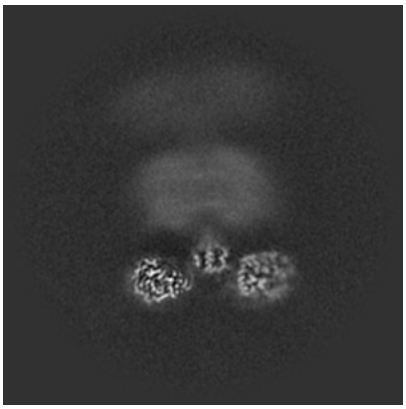


Z

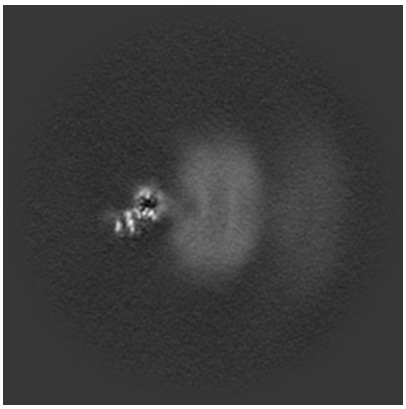
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

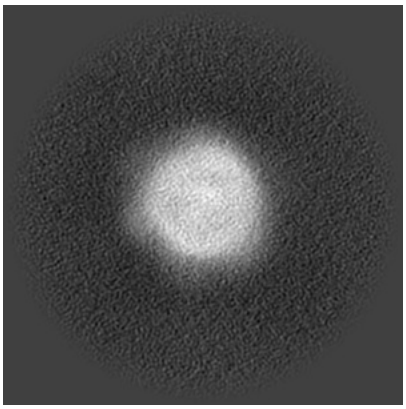
6.2.1 Primary map



X Index: 280

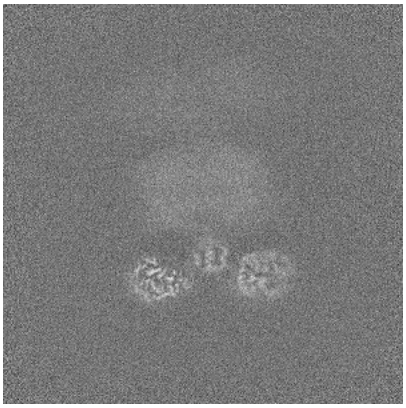


Y Index: 280

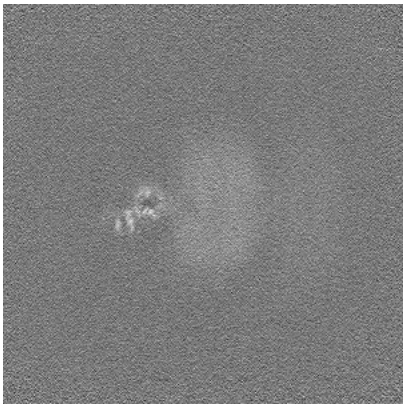


Z Index: 280

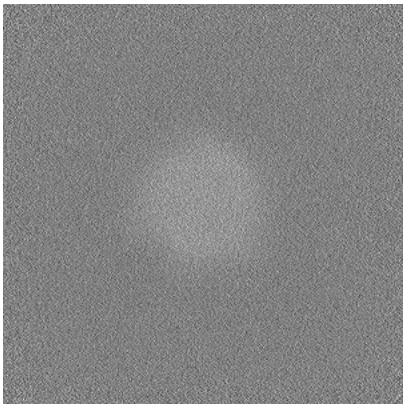
6.2.2 Raw map



X Index: 280



Y Index: 280

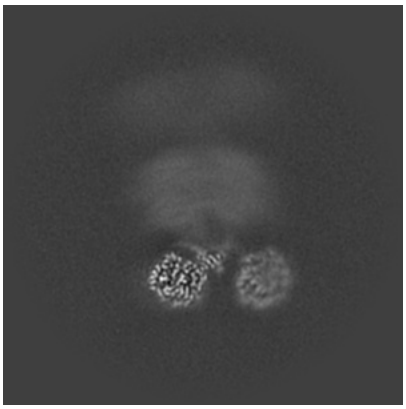


Z Index: 280

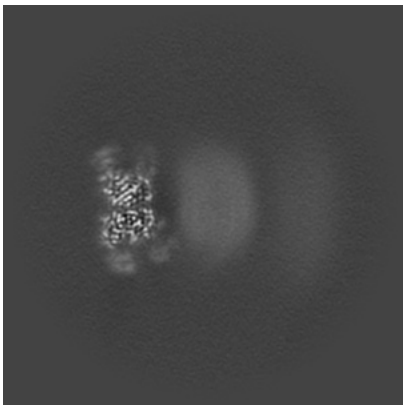
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

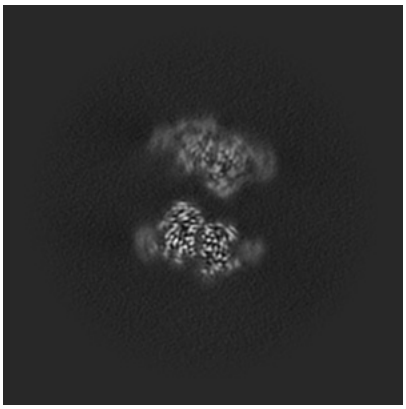
6.3.1 Primary map



X Index: 265

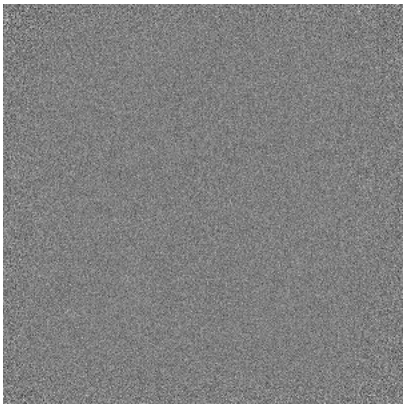


Y Index: 232

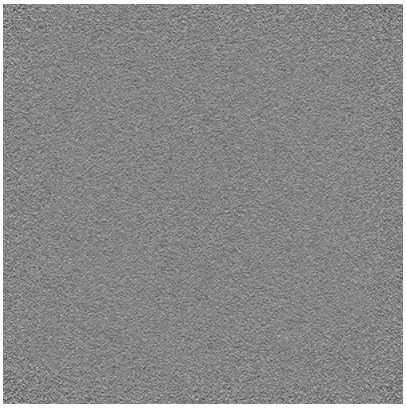


Z Index: 161

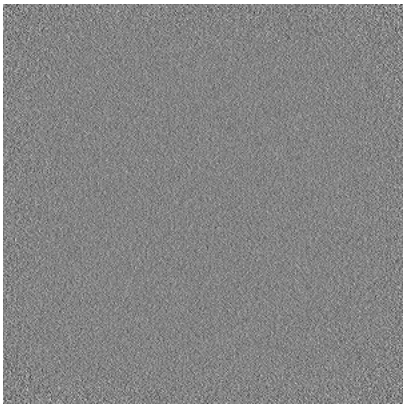
6.3.2 Raw map



X Index: 0



Y Index: 0

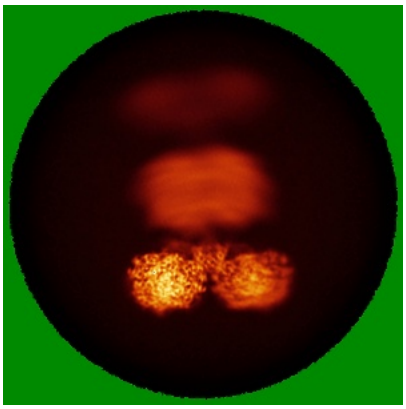


Z Index: 0

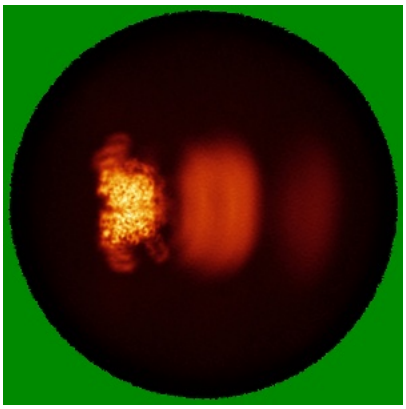
The images above show the largest variance slices of the map in three orthogonal directions.

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

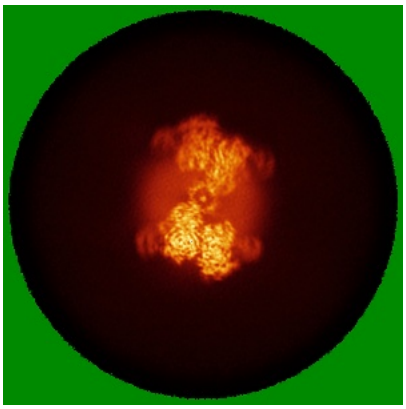
6.4.1 Primary map



X

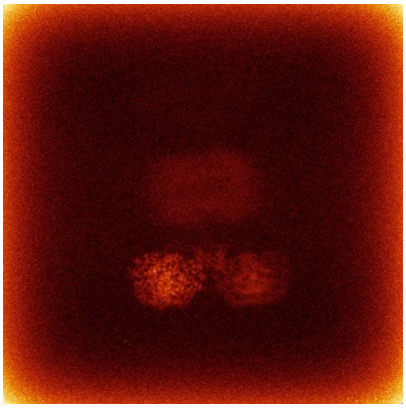


Y

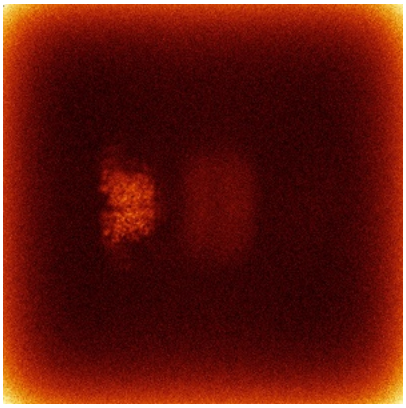


Z

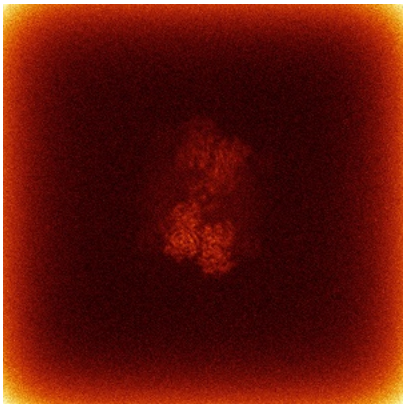
6.4.2 Raw map



X



Y

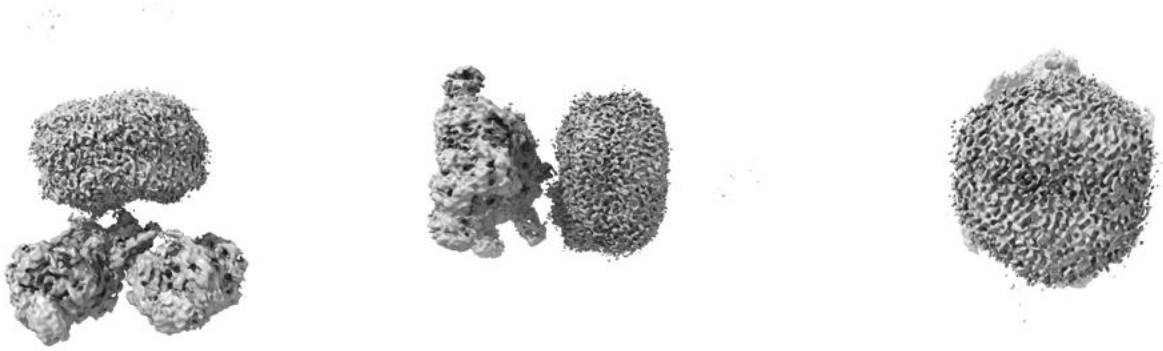


Z

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)

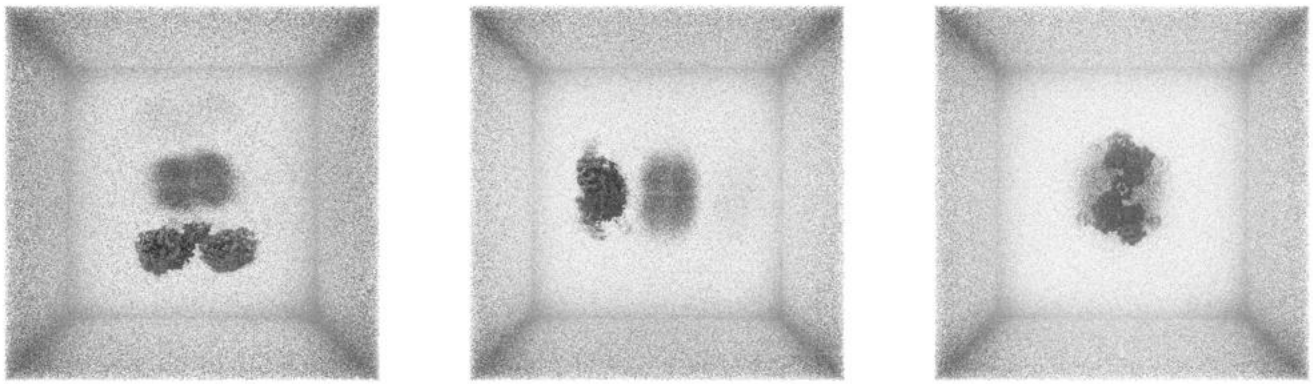
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.03. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map



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.

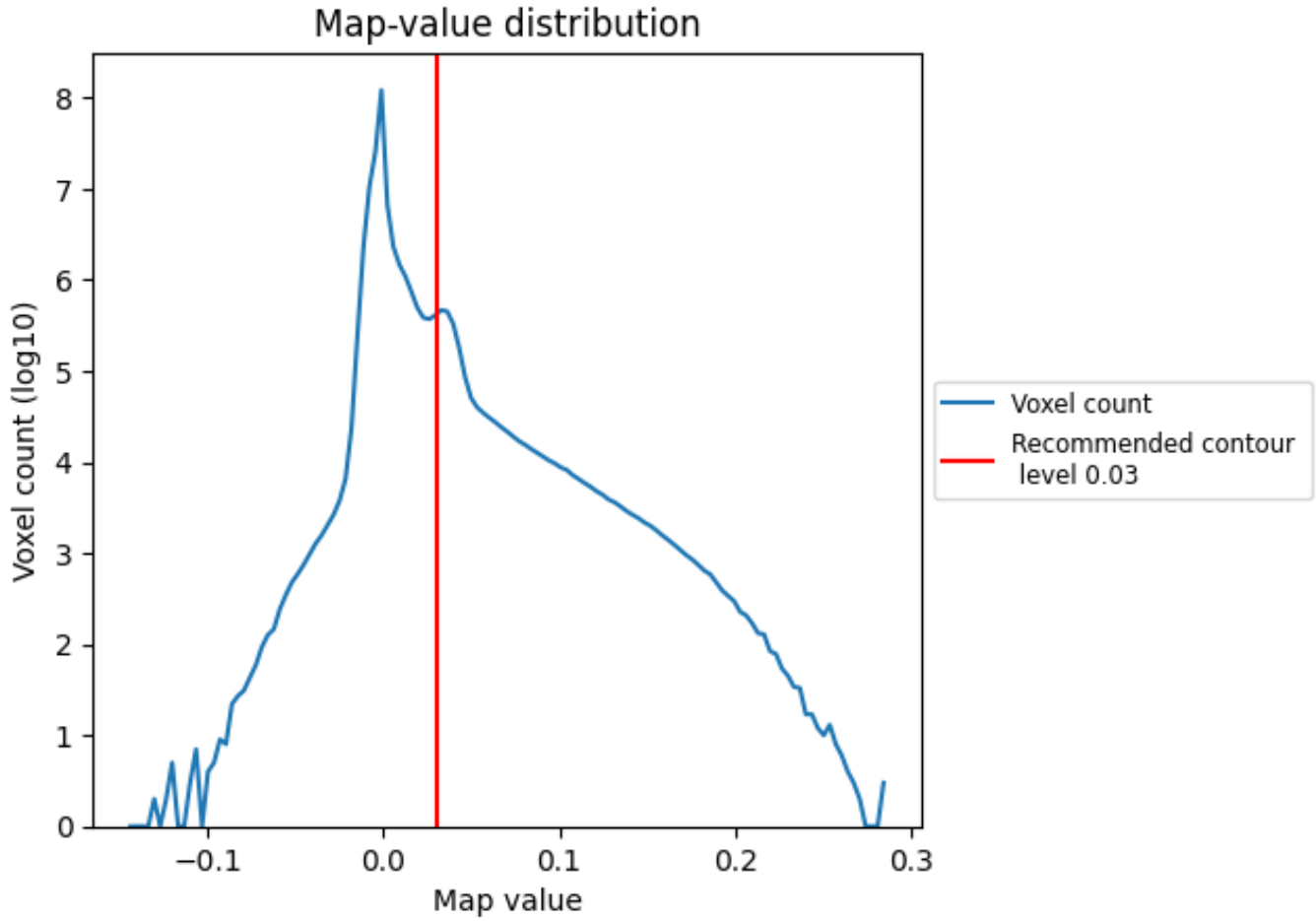
6.6 Mask visualisation (i)

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

7 Map analysis

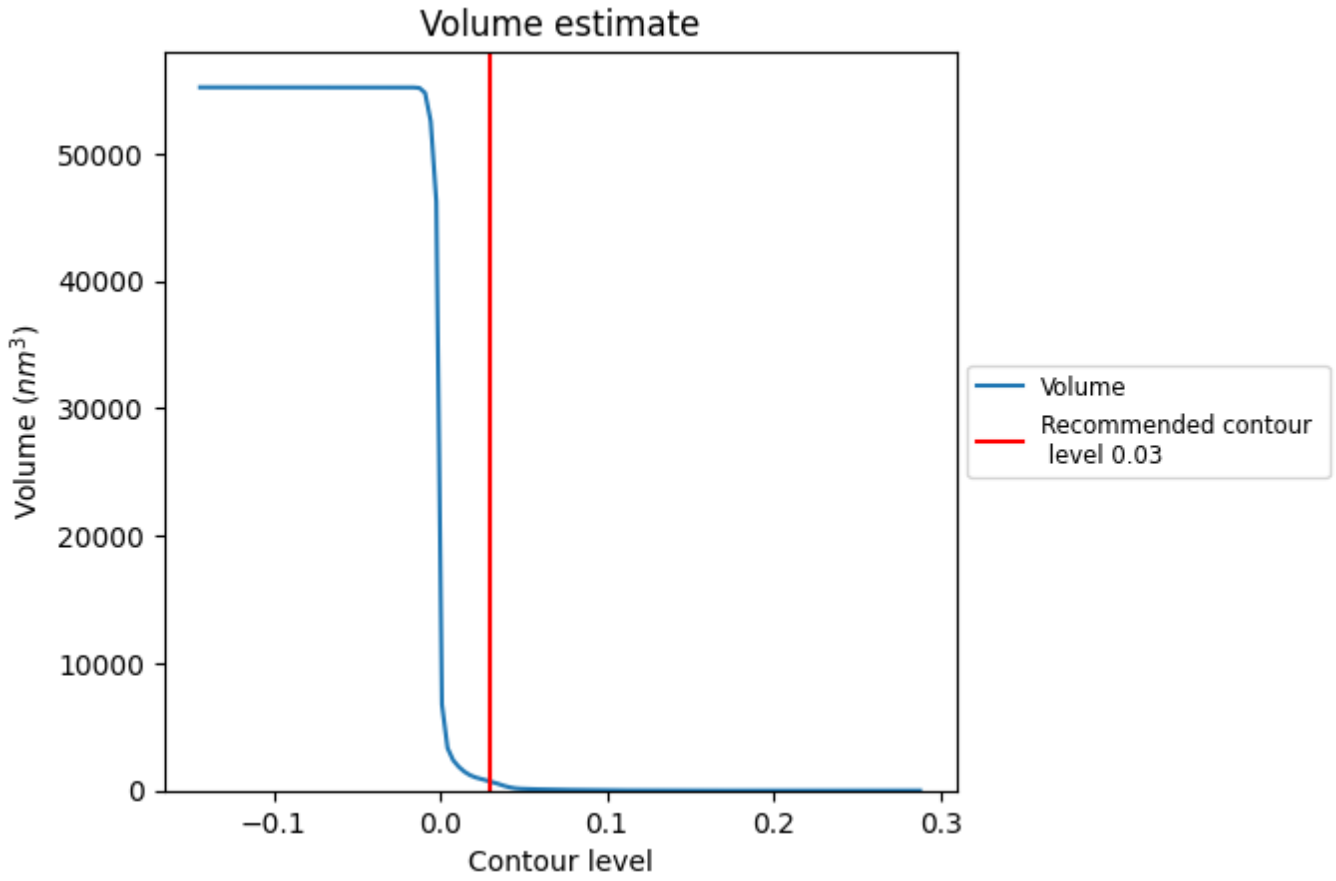
This section contains the results of statistical analysis of the map.

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.

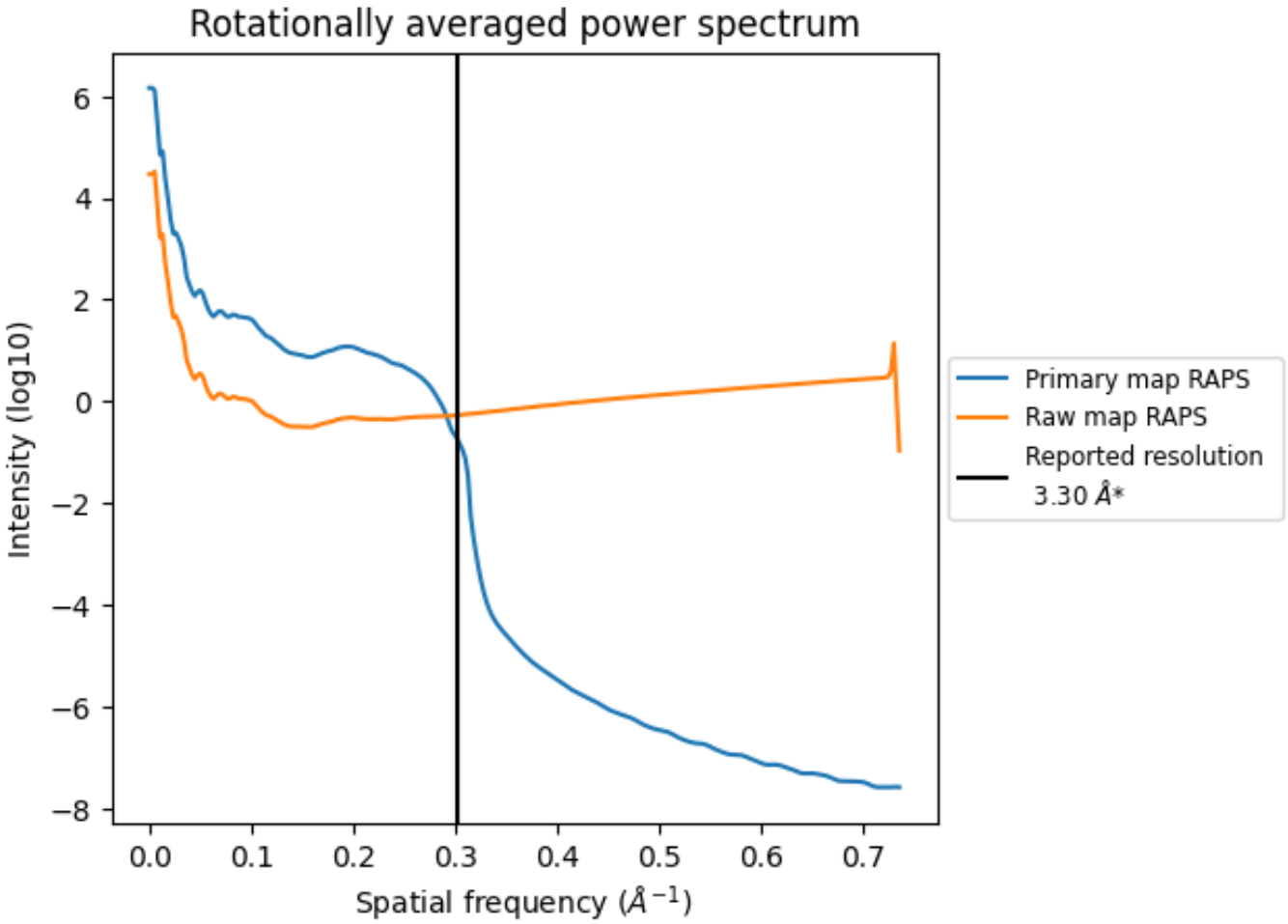
7.2 Volume estimate



The volume at the recommended contour level is 716 nm^3; this corresponds to an approximate mass of 646 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)

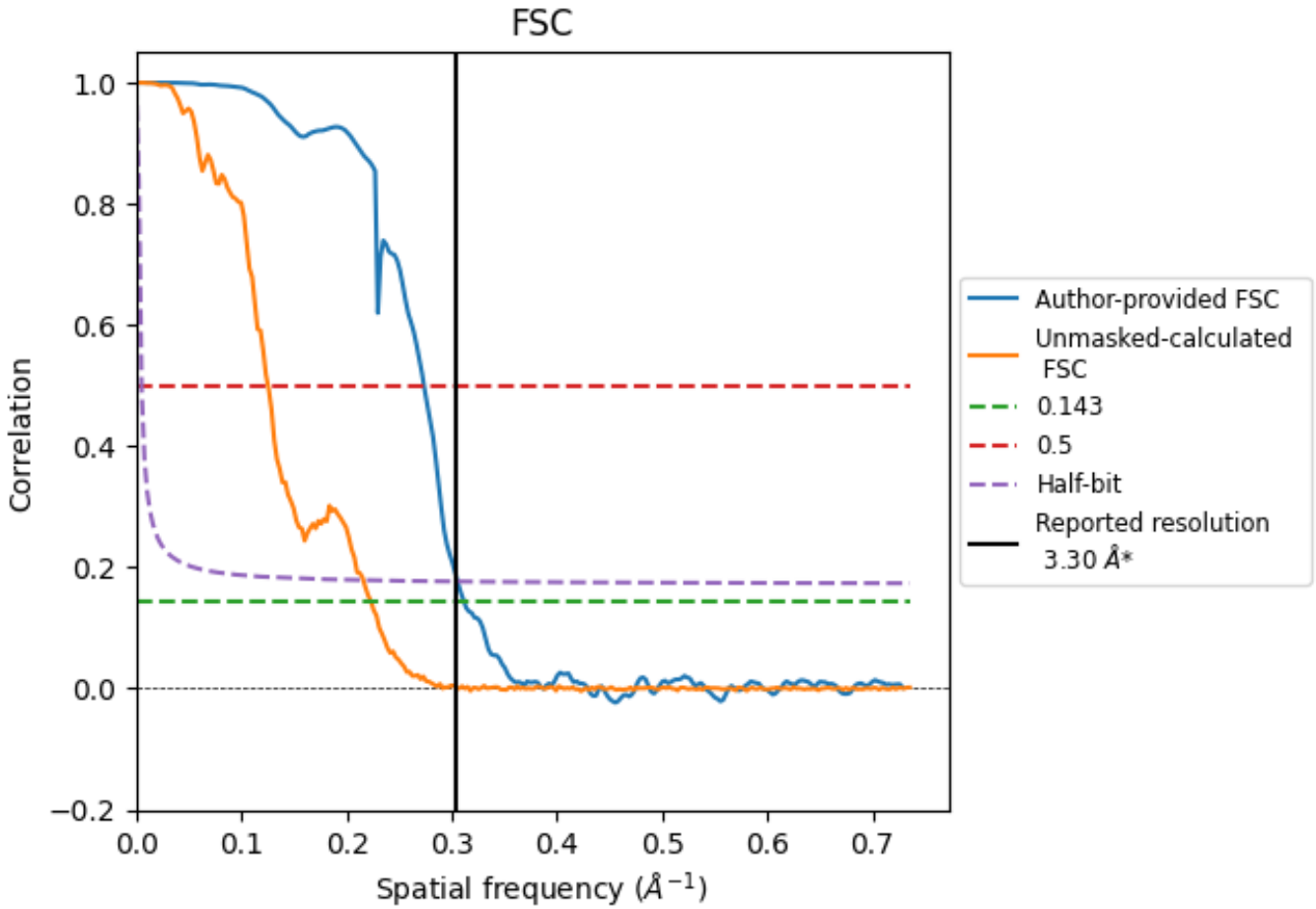


*Reported resolution corresponds to spatial frequency of 0.303 Å^{-1}

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 0.303 Å^{-1}

8.2 Resolution estimates (i)

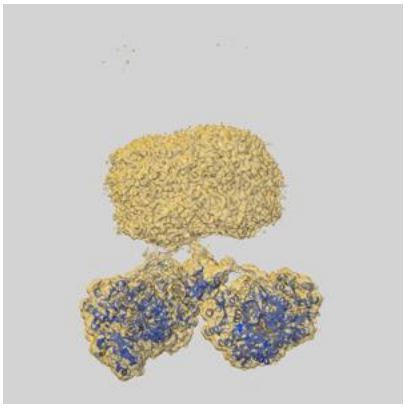
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.30	-	-
Author-provided FSC curve	3.21	3.65	3.27
Unmasked-calculated*	4.48	7.97	4.63

*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 4.48 differs from the reported value 3.3 by more than 10 %

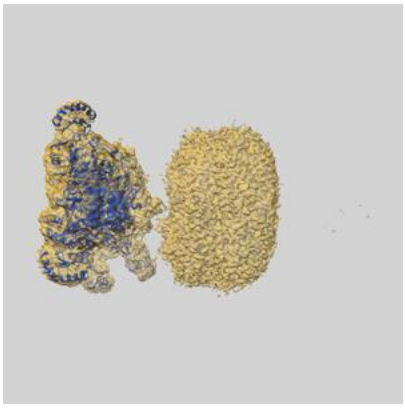
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-55717 and PDB model 9T96. Per-residue inclusion information can be found in section 3 on page 6.

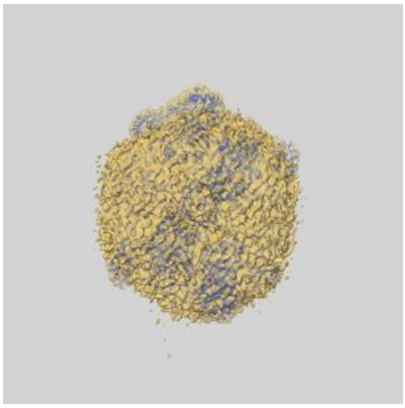
9.1 Map-model overlay



X



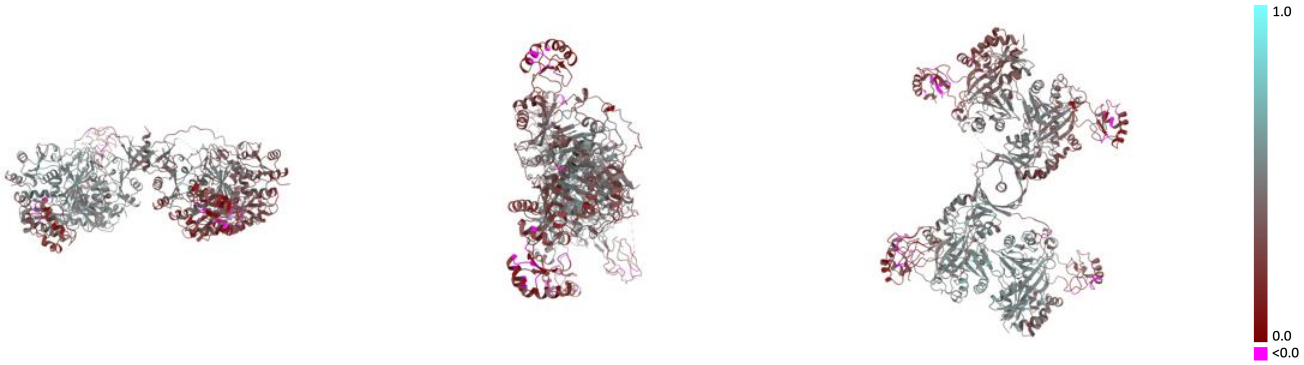
Y



Z

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

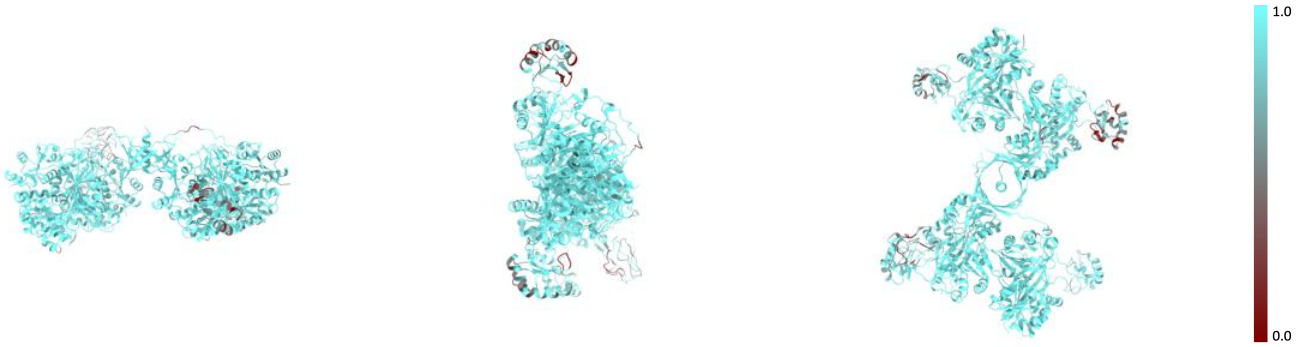
9.2 Q-score mapped to coordinate model (i)



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.

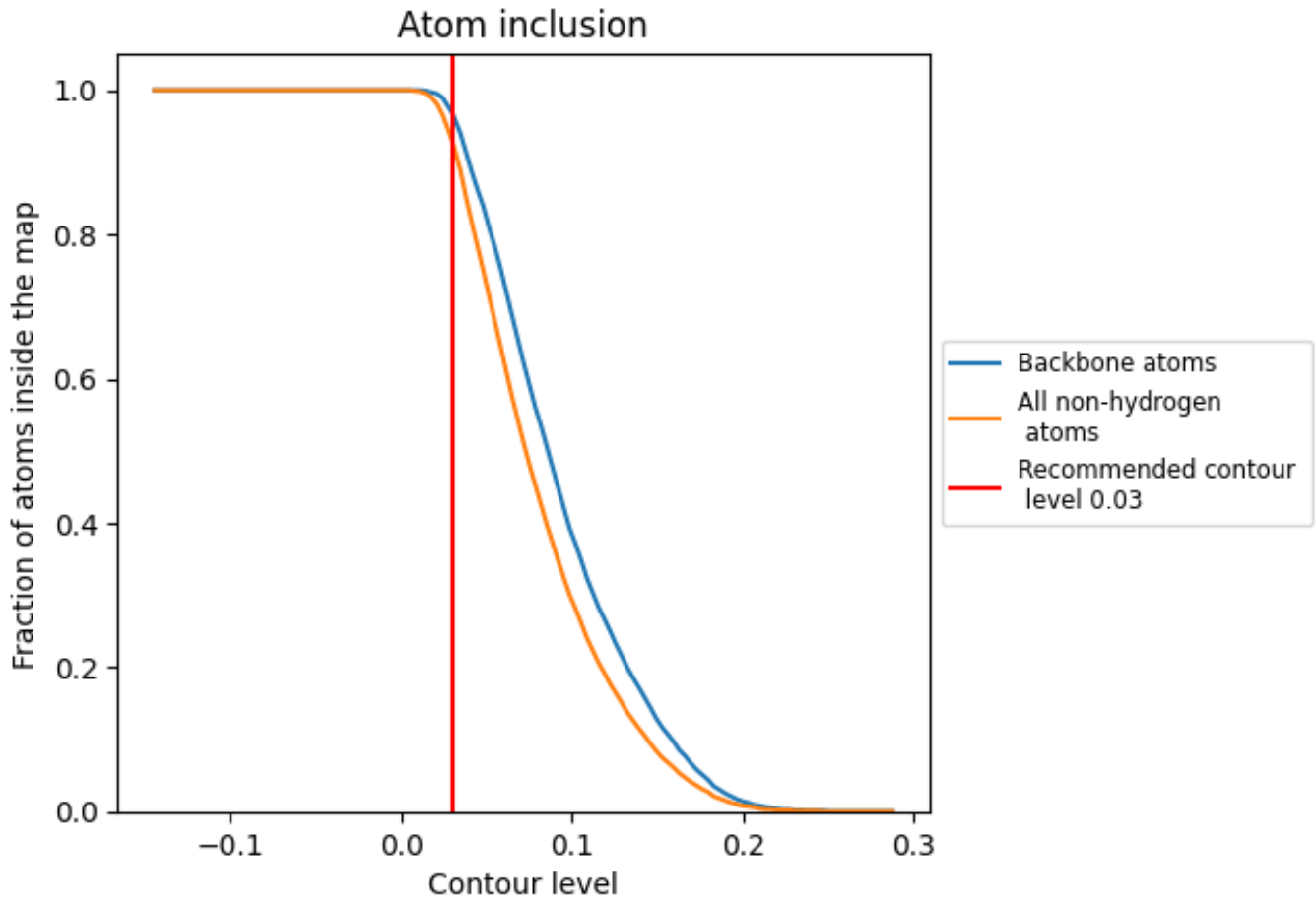
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.03).

9.4 Atom inclusion (i)



At the recommended contour level, 97% of all backbone atoms, 93% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.03) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9310	0.3910
A3a	0.9230	0.4330
A3b	0.9710	0.4470
A3c	0.9110	0.3600
A3d	0.9200	0.3150
E5a	0.9680	0.4470

