Full wwPDB EM Validation Report ⓘ

May 11, 2026 – 10:28 pm BST

PDB ID	:	9TIO / pdb_00009tio
EMDB ID	:	EMD-55963
Title	:	Phage 812 baseplate in the pre-contraction state - upper arm (segment B)
Authors	:	Binovsky, J.; Plevka, P.
Deposited on	:	2025-12-05
Resolution	:	3.90 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:

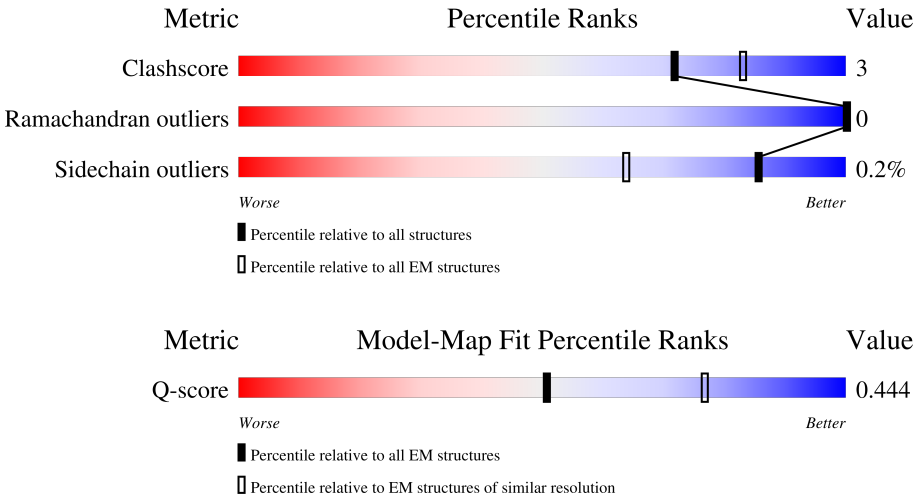
EMDB validation analysis	:	0.0.1.dev132
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

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 3.90 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	8855 (3.40 - 4.40)

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	1152	27% 70%
1	B	1152	13% 86%
1	D	1152	13% 86%
2	C	173	6% 60% 36%

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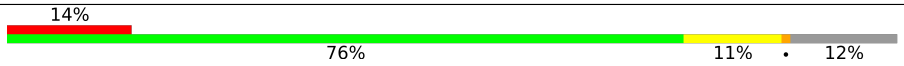
Mol	Chain	Length	Quality of chain
2	E	173	
2	F	173	
2	K	173	
3	G	1019	
4	H	640	
4	I	640	
4	J	640	

2 Entry composition (i)

There are 4 unique types of molecules in this entry. The entry contains 15828 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 ORF65.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	342	Total	C	N	O	S	0	0
			2695	1692	441	554	8		
1	B	165	Total	C	N	O	S	0	0
			1306	823	211	269	3		
1	D	166	Total	C	N	O	S	0	0
			1314	829	212	270	3		

- Molecule 2 is a protein called ORF64.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	111	Total	C	N	O	S	0	0
			889	578	145	165	1		
2	E	172	Total	C	N	O	S	0	0
			1349	858	221	269	1		
2	F	163	Total	C	N	O	S	0	0
			1277	817	208	251	1		
2	K	152	Total	C	N	O	S	0	0
			1199	769	196	233	1		

- Molecule 3 is a protein called ORF63.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	G	257	Total	C	N	O	S	0	0
			2138	1364	339	428	7		

- Molecule 4 is a protein called CBM-cenC domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	H	145	Total	C	N	O	S	0	0
			1193	760	192	239	2		
4	I	157	Total	C	N	O	S	0	0
			1259	798	205	254	2		

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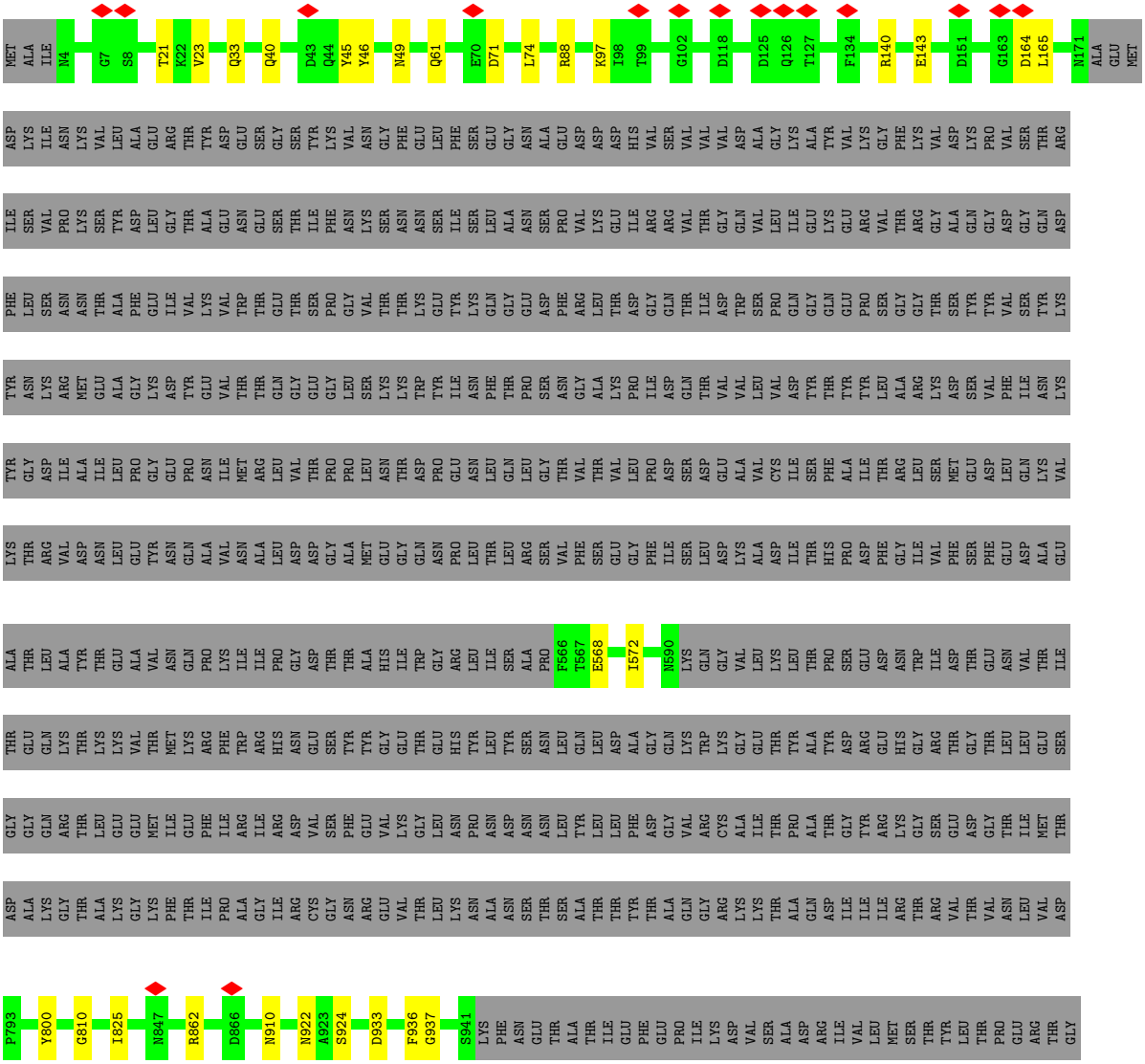
Mol	Chain	Residues	Atoms					AltConf	Trace
4	J	151	Total	C	N	O	S	0	0
			1209	768	198	241	2		

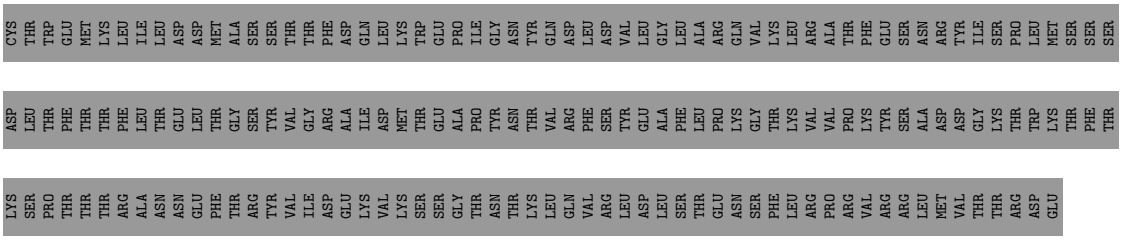
3 Residue-property plots (i)

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: ORF65

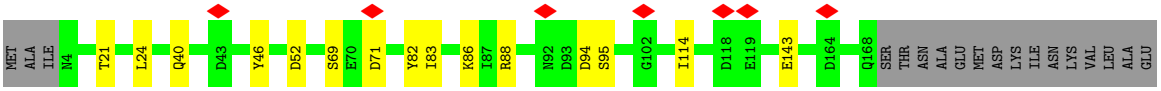
Chain A:

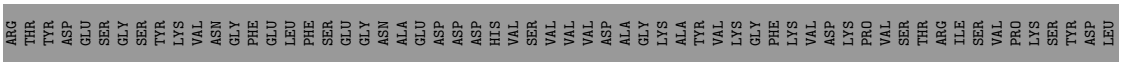


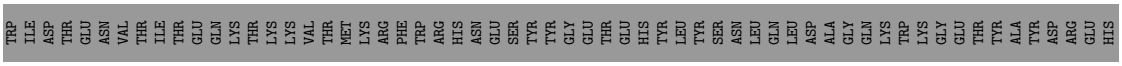


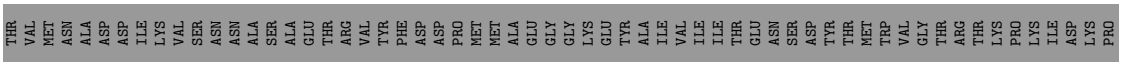
• Molecule 1: ORF65

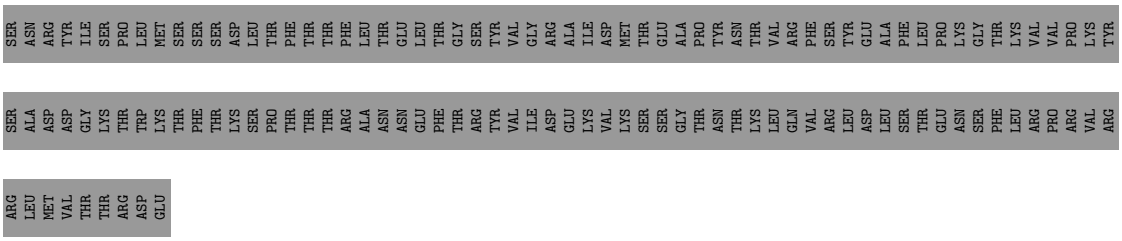
Chain B:





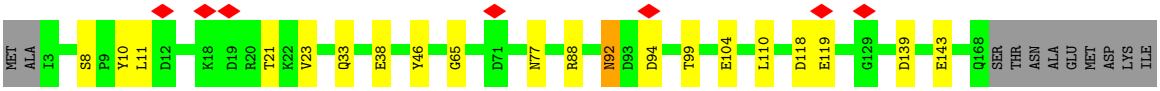


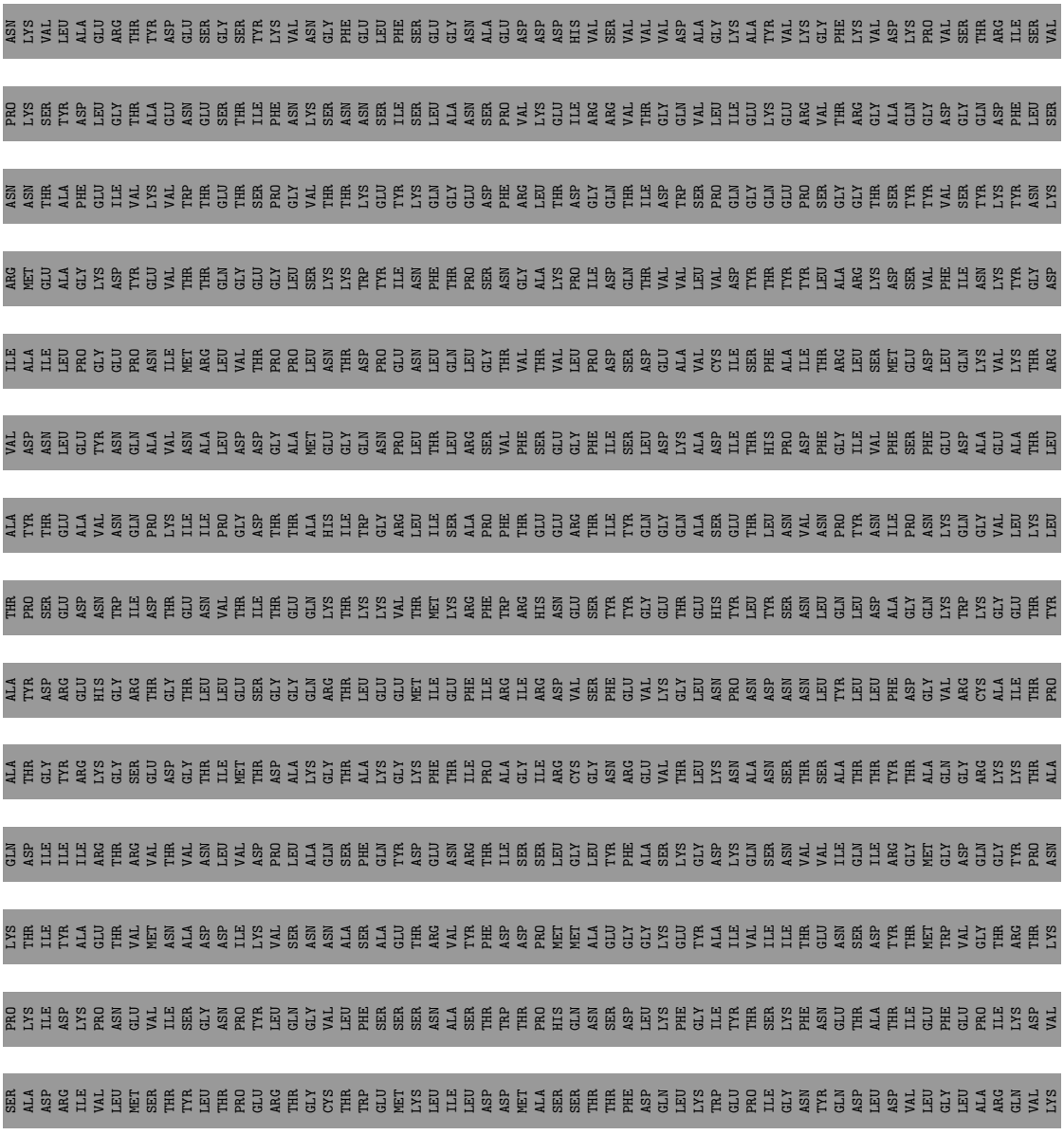


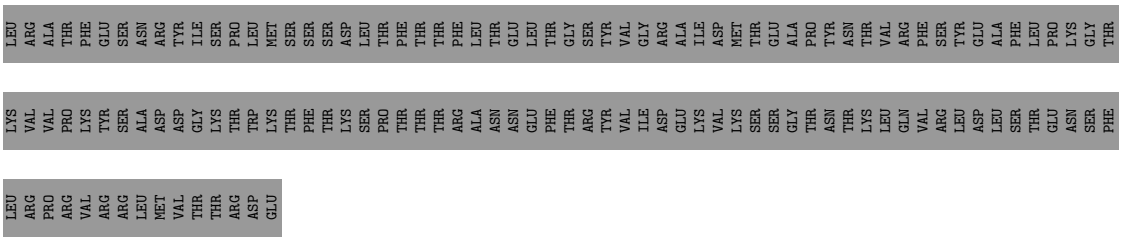


• Molecule 1: ORF65

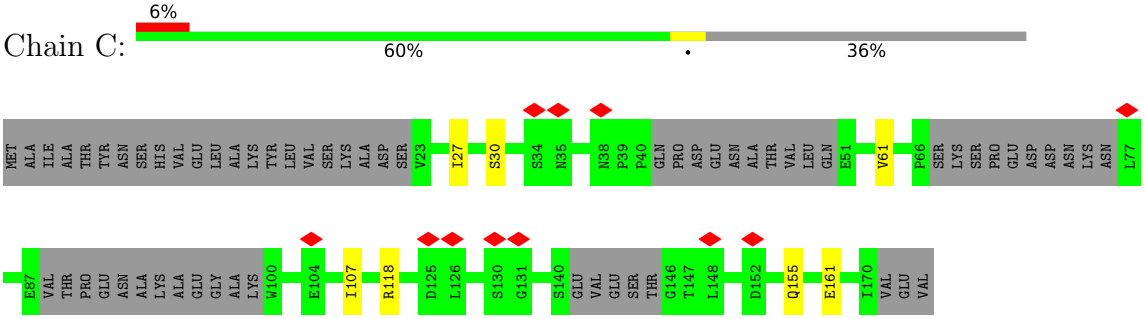
Chain D:



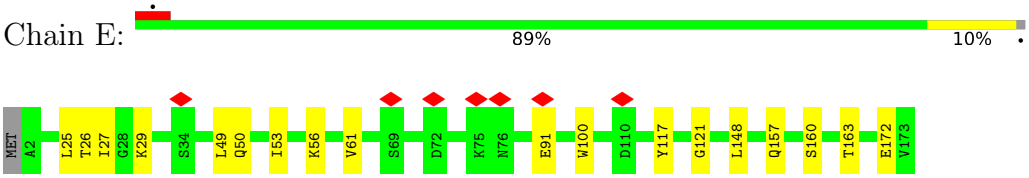




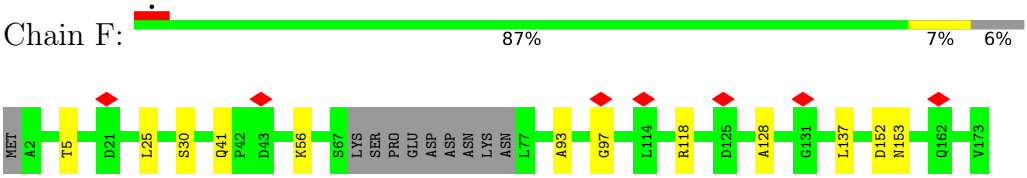
• Molecule 2: ORF64



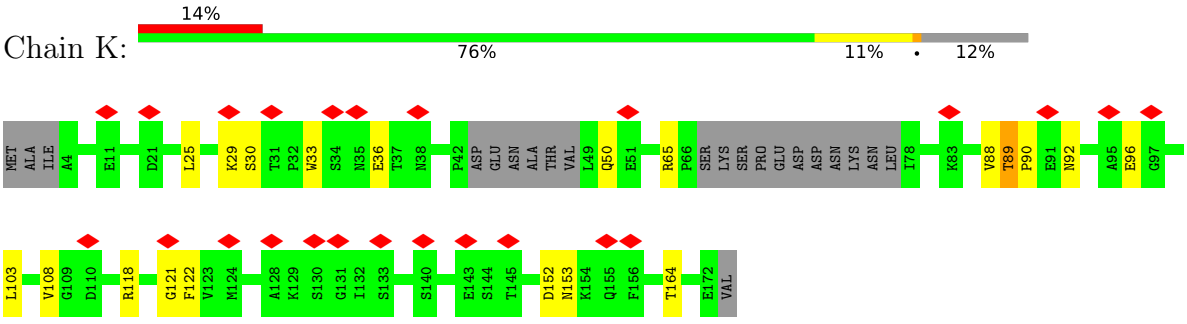
• Molecule 2: ORF64



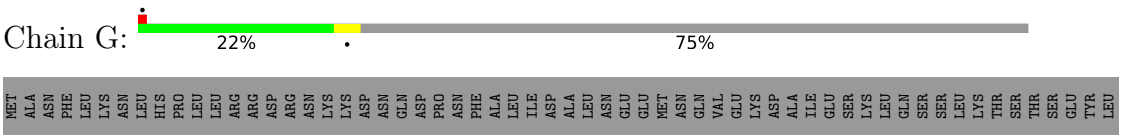
• Molecule 2: ORF64

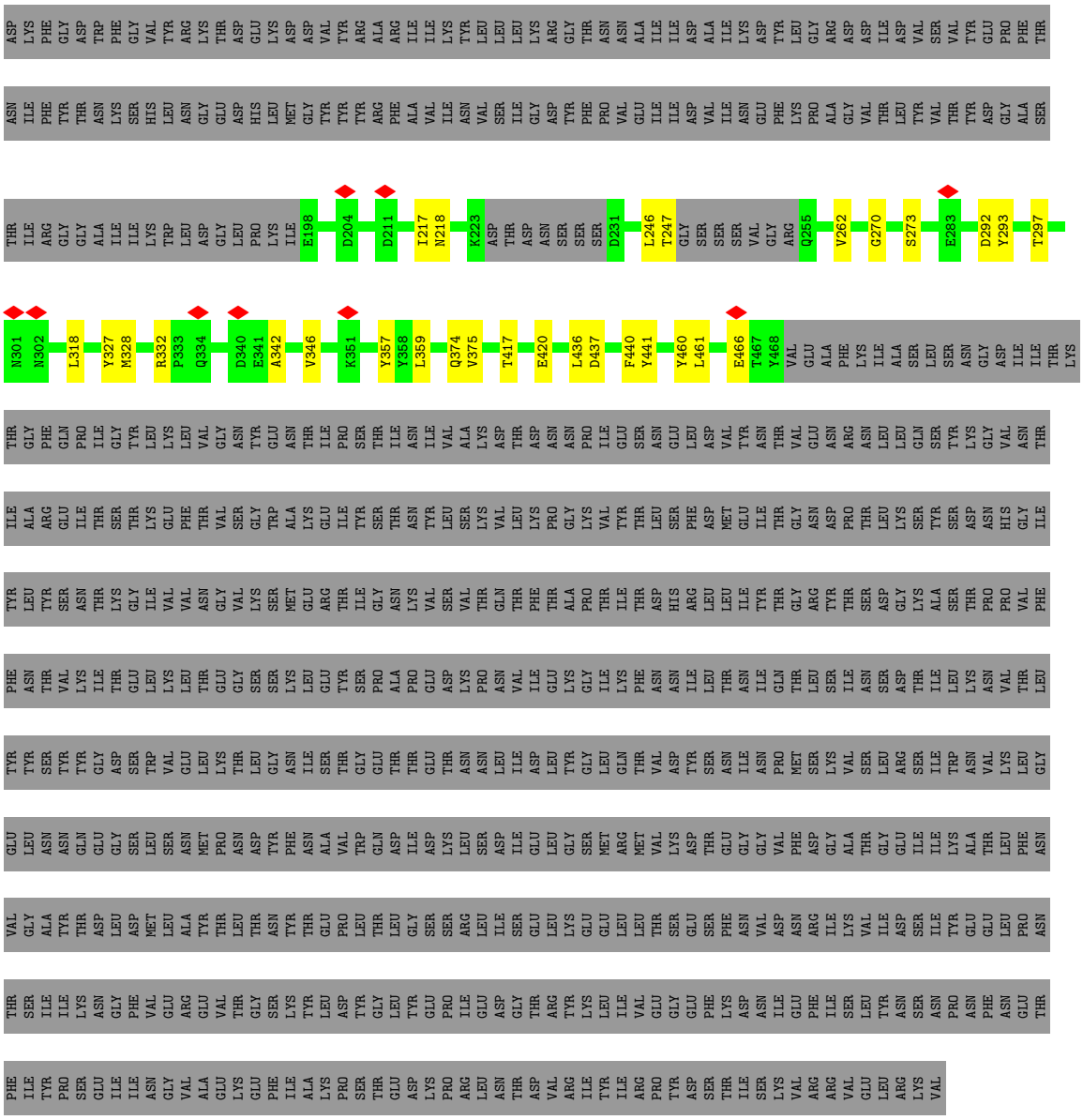


• Molecule 2: ORF64



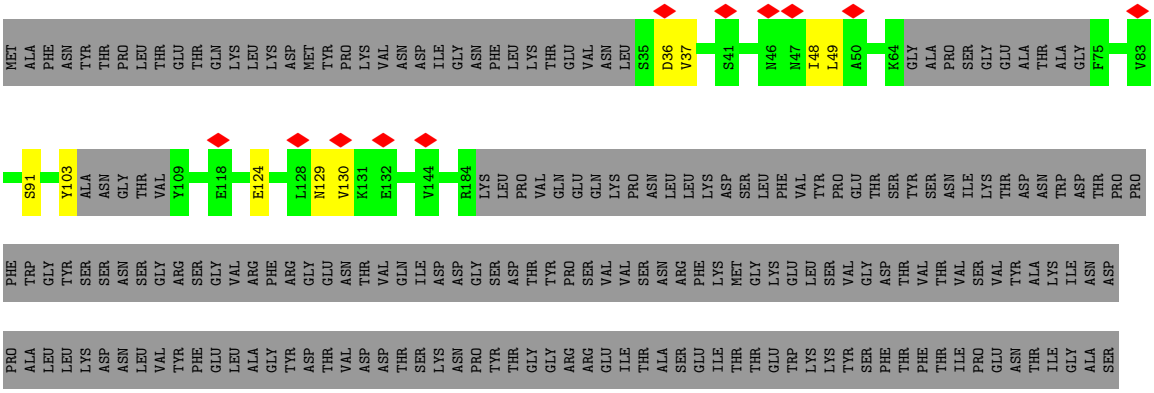
• Molecule 3: ORF63





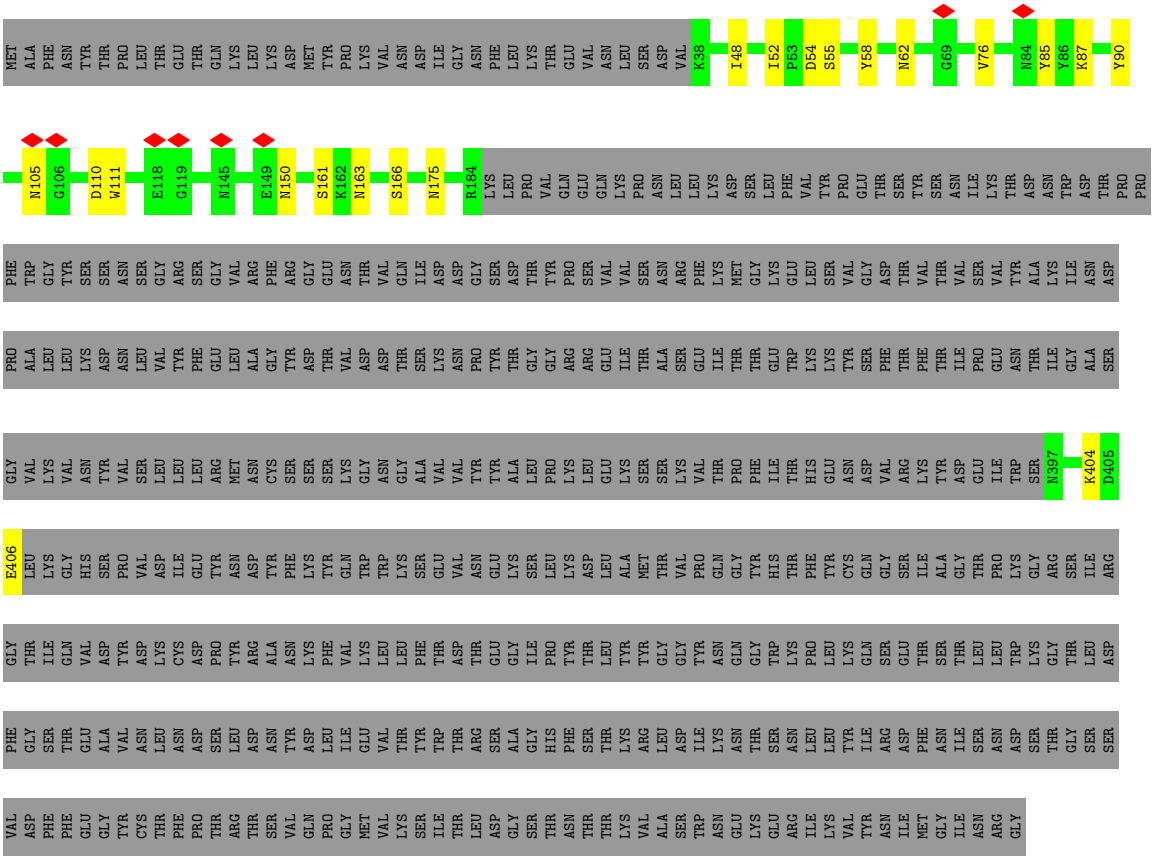
• Molecule 4: CBM-cenC domain-containing protein

Chain H:



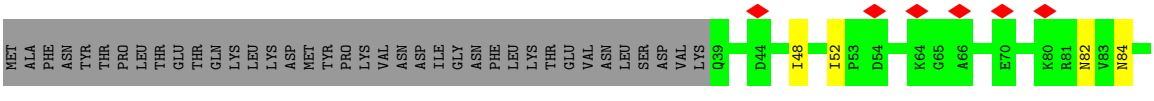
• Molecule 4: CBM-cenC domain-containing protein

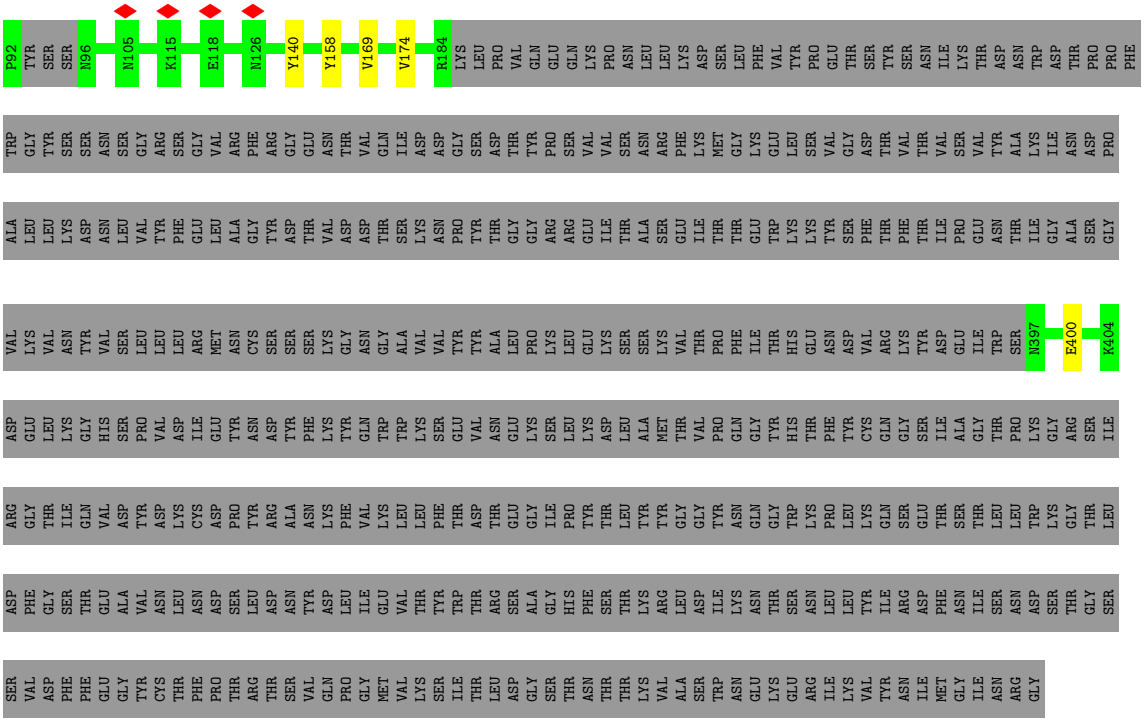
Chain I:



• Molecule 4: CBM-cenC domain-containing protein

Chain J:




P92 TYR SER SER N96 N105 K115 E118 N126 Y140 Y158 V169 V174 R184 LYS LEU PRO VAL GLN GLU GLN LYS PRO ASN LEU LEU LYS ASP SER LEU PHE VAL TYR PRO GLU THR SER TYR SER ASN ILE LYS THR ASP ASN TRP ASP THR PRO PRO PHE
TRP GLY TYR SER SER ASN SER GLY ARG SER GLY VAL ARG PHE ARG GLY GLU ASN THR VAL GLN ILE ASP ASP GLY SER ASP THR TYR PRO SER VAL VAL SER ASN ARG PHE LYS MET GLY LYS GLU LEU SER VAL GLY ASP THR VAL THR VAL THR GLU ALA ALA LYS ILE ASN ASP PRO
ALA LEU LEU LYS ASP ASN LEU VAL TYR PHE GLU LEU ALA GLY TYR ASP THR VAL ASP ASP THR SER LYS ASN PRO TYR THR GLY GLY ARG ARG GLU ILE THR ALA SER GLU ILE THR THR GLU TRP LYS LYS TYR SER PHE THR PHE THR ILE PRO GLU ASN THR ILE GLY ALA SER GLY
VAL LYS VAL ASN TYR VAL SER LEU LEU LEU ARG MET ASN CYS SER SER SER LYS GLY ASN GLY ALA VAL VAL TYR TYR ALA LEU PRO LYS LEU GLU LYS SER SER LYS VAL THR PRO PHE ILE THR HIS GLU ASN ASP VAL ARG LYS TYR ASP GLU ILE TRP SER N397 E400 K404
ASP GLU LEU LYS GLY HIS SER PRO VAL ASP ILE GLU TYR ASN ASP TYR PHE LYS TYR GLN TRP TRP LYS SER GLU VAL ASN GLU LYS SER LEU LYS ASP LEU ALA MET THR VAL PRO GLN GLY TYR HIS THR PHE TYR CYS GLN GLY SER ILE ALA GLY THR PRO LYS GLY ARG SER ILE
ARG GLY THR ILE GLN VAL ASP TYR ASP LYS CYS ASP PRO TYR ARG ALA ASN LYS PHE VAL LYS LEU LEU PHE THR ASP THR GLU GLY ILE PRO TYR THR LEU TYR TYR GLY GLY TYR ASN GLN GLY TRP LYS PRO LEU LYS GLN SER GLU THR SER THR LEU LEU TRP LYS GLY THR LEU
ASP PHE GLY SER THR GLU ALA VAL ASN LEU ASN ASP SER LEU ASP ASN TYR ASP LEU ILE GLU VAL THR TYR TRP THR ARG SER ALA GLY HIS PHE SER THR LYS ARG LEU ASP ILE LYS ASN THR SER ASN LEU LEU TYR ILE ARG ASP PHE ASN ILE SER ASN ASP SER THR GLY SER
SER VAL ASP PHE PHE GLU GLY TYR CYS THR PHE PRO THR ARG THR SER VAL GLN PRO GLY MET VAL LYS SER ILE THR LEU ASP GLY SER THR ASN THR THR LYS VAL ALA SER TRP ASN GLU LYS GLU ARG ILE LYS VAL TYR ASN ILE MET GLY ILE ASN ARG GLY

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	19727	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING ONLY	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	40.8	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.221	Depositor
Minimum map value	-0.111	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.04	Depositor
Map size (Å)	300.096, 300.096, 300.096	wwPDB
Map dimensions	180, 180, 180	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.6672001, 1.6672001, 1.6672001	Depositor

5 Model quality

5.1 Standard geometry

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	#$\|Z\|>5$	RMSZ	#$\|Z\|>5$
1	A	0.11	0/2748	0.30	0/3725
1	B	0.10	0/1330	0.31	0/1800
1	D	0.12	0/1338	0.33	0/1811
2	C	0.11	0/907	0.29	0/1225
2	E	0.11	0/1377	0.32	0/1872
2	F	0.11	0/1303	0.28	0/1771
2	K	0.12	0/1224	0.30	0/1660
3	G	0.10	0/2185	0.29	0/2961
4	H	0.11	0/1219	0.30	0/1651
4	I	0.11	0/1288	0.27	0/1749
4	J	0.11	0/1236	0.32	0/1678
All	All	0.11	0/16155	0.30	0/21903

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2695	0	2590	17	0
1	B	1306	0	1267	10	0
1	D	1314	0	1278	14	0
2	C	889	0	893	5	0
2	E	1349	0	1339	13	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	F	1277	0	1274	7	0
2	K	1199	0	1195	12	0
3	G	2138	0	2032	18	0
4	H	1193	0	1144	5	0
4	I	1259	0	1207	13	0
4	J	1209	0	1164	5	0
All	All	15828	0	15383	105	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 3.

All (105) 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:B:83:ILE:O	1:B:88:ARG:NH1	2.18	0.77
1:B:69:SER:OG	1:B:71:ASP:OD1	2.05	0.75
1:A:88:ARG:NH2	1:A:143:GLU:OE1	2.20	0.74
2:F:30:SER:O	2:F:118:ARG:NH1	2.25	0.70
4:I:85:TYR:OH	4:I:105:ASN:OD1	2.05	0.69
1:D:99:THR:OG1	1:D:104:GLU:OE2	2.11	0.68
1:D:65:GLY:O	1:D:77:ASN:ND2	2.28	0.67
1:D:92:ASN:ND2	1:D:94:ASP:OD1	2.28	0.66
2:K:33:TRP:N	2:K:36:GLU:OE2	2.29	0.65
4:H:36:ASP:OD1	4:H:37:VAL:N	2.31	0.64
2:E:117:TYR:OH	2:E:157:GLN:NE2	2.31	0.63
3:G:218:ASN:ND2	3:G:437:ASP:OD1	2.30	0.63
2:K:89:THR:HG22	2:K:90:PRO:HD2	1.79	0.63
1:A:922:ASN:OD1	1:A:924:SER:OG	2.09	0.63
1:B:86:LYS:O	1:B:88:ARG:NH1	2.32	0.62
1:D:33:GLN:N	1:D:33:GLN:OE1	2.32	0.62
4:H:124:GLU:OE2	4:I:163:ASN:ND2	2.33	0.62
2:E:100:TRP:NE1	2:E:172:GLU:OE1	2.33	0.62
3:G:460:TYR:HE2	2:K:164:THR:HG23	1.64	0.61
3:G:246:LEU:O	3:G:247:THR:OG1	2.15	0.60
2:K:25:LEU:HD12	2:K:121:GLY:O	2.02	0.59
2:E:91:GLU:N	2:E:91:GLU:OE1	2.36	0.59
4:J:82:ASN:OD1	4:J:84:ASN:ND2	2.36	0.58
1:D:118:ASP:OD1	1:D:119:GLU:N	2.37	0.58
1:A:33:GLN:N	1:A:33:GLN:OE1	2.35	0.58
1:A:910:ASN:ND2	1:A:933:ASP:OD2	2.37	0.57
4:H:91:SER:OG	4:I:87:LYS:NZ	2.38	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:45:TYR:O	1:A:49:ASN:ND2	2.39	0.56
2:C:155:GLN:OE1	2:C:155:GLN:N	2.38	0.55
1:A:71:ASP:O	1:A:97:LYS:NZ	2.36	0.55
2:E:27:ILE:HG22	2:E:53:ILE:HD12	1.89	0.54
2:F:25:LEU:N	2:F:56:LYS:O	2.37	0.54
2:C:30:SER:O	2:C:118:ARG:NH1	2.41	0.54
2:K:108:VAL:HA	2:K:164:THR:HG22	1.90	0.53
4:H:129:ASN:OD1	4:H:130:VAL:N	2.41	0.52
3:G:466:GLU:OE1	3:G:466:GLU:N	2.42	0.52
4:J:140:TYR:OH	4:J:174:VAL:HG21	2.08	0.52
2:K:92:ASN:O	2:K:96:GLU:N	2.38	0.52
4:I:110:ASP:OD1	4:I:111:TRP:N	2.43	0.52
4:I:406:GLU:N	4:I:406:GLU:OE1	2.43	0.52
1:D:21:THR:HG22	1:D:46:TYR:OH	2.08	0.51
4:J:158:TYR:CD2	4:J:169:VAL:HG22	2.45	0.51
1:A:140:ARG:NH2	1:D:38:GLU:OE1	2.43	0.51
2:K:29:LYS:N	2:K:50:GLN:O	2.43	0.51
4:I:150:ASN:O	4:I:175:ASN:ND2	2.40	0.51
2:F:152:ASP:OD1	2:F:153:ASN:N	2.44	0.50
2:E:26:THR:HG23	2:E:49:LEU:HD11	1.94	0.50
1:B:88:ARG:NH2	1:B:143:GLU:OE1	2.43	0.49
2:K:103:LEU:HD21	2:K:122:PHE:CG	2.46	0.49
3:G:342:ALA:O	3:G:346:VAL:HG23	2.12	0.49
2:E:61:VAL:HG23	2:E:61:VAL:O	2.13	0.49
2:E:29:LYS:N	2:E:50:GLN:O	2.44	0.49
2:K:152:ASP:OD1	2:K:153:ASN:N	2.45	0.49
3:G:293:TYR:O	3:G:297:THR:OG1	2.24	0.49
1:D:88:ARG:NH2	1:D:143:GLU:OE1	2.42	0.48
2:C:61:VAL:HG23	2:C:61:VAL:O	2.13	0.48
1:A:21:THR:HG22	1:A:46:TYR:OH	2.13	0.48
2:E:25:LEU:N	2:E:56:LYS:O	2.45	0.48
1:B:114:ILE:N	1:B:114:ILE:HD12	2.29	0.48
2:F:93:ALA:O	2:F:97:GLY:N	2.46	0.48
1:B:21:THR:HG22	1:B:46:TYR:OH	2.13	0.47
1:D:119:GLU:OE2	4:I:62:ASN:ND2	2.44	0.47
3:G:218:ASN:ND2	3:G:436:LEU:O	2.47	0.47
4:I:404:LYS:N	4:J:400:GLU:O	2.47	0.47
4:J:48:ILE:HD11	4:J:52:ILE:HD12	1.97	0.46
2:K:30:SER:O	2:K:118:ARG:NH1	2.49	0.46
2:E:148:LEU:O	2:F:5:THR:OG1	2.23	0.46
4:I:76:VAL:HG22	4:I:90:TYR:HD1	1.81	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:G:262:VAL:HG22	3:G:318:LEU:HD13	1.98	0.46
3:G:270:GLY:N	3:G:273:SER:OG	2.50	0.45
1:A:572:ILE:HD12	1:A:800:TYR:CZ	2.51	0.45
2:E:25:LEU:HD12	2:E:121:GLY:O	2.17	0.45
2:F:41:GLN:OE1	3:G:327:TYR:OH	2.29	0.45
1:D:10:TYR:O	1:D:11:LEU:C	2.60	0.45
2:E:160:SER:HB3	2:E:163:THR:HG23	1.98	0.44
4:I:161:SER:OG	4:I:166:SER:O	2.27	0.44
1:A:23:VAL:O	1:B:40:GLN:NE2	2.48	0.44
1:B:52:ASP:OD1	1:B:82:TYR:OH	2.35	0.44
4:H:48:ILE:HG23	4:H:49:LEU:HD12	2.00	0.43
4:I:54:ASP:OD1	4:I:55:SER:N	2.51	0.43
1:D:8:SER:N	3:G:292:ASP:OD2	2.52	0.42
3:G:357:TYR:CE1	3:G:359:LEU:HD21	2.54	0.42
1:A:810:GLY:N	1:A:937:GLY:O	2.47	0.42
2:K:88:VAL:HG12	2:K:89:THR:N	2.34	0.42
1:A:74:LEU:C	1:A:74:LEU:HD23	2.45	0.41
1:A:568:GLU:OE1	1:A:862:ARG:NH1	2.51	0.41
1:A:825:ILE:HD12	1:A:825:ILE:N	2.34	0.41
2:C:27:ILE:HD12	2:C:107:ILE:CD1	2.49	0.41
4:I:58:TYR:N	4:I:76:VAL:O	2.47	0.41
2:K:65:ARG:NH2	2:K:96:GLU:OE2	2.53	0.41
1:A:164:ASP:OD1	1:A:165:LEU:N	2.53	0.41
3:G:328:MET:O	3:G:332:ARG:N	2.49	0.41
3:G:375:VAL:HG22	3:G:417:THR:HG22	2.03	0.41
1:A:40:GLN:NE2	1:D:23:VAL:O	2.46	0.41
1:A:61:GLN:N	1:A:61:GLN:OE1	2.54	0.41
2:E:157:GLN:NE2	3:G:461:LEU:HD22	2.35	0.41
4:I:48:ILE:HD11	4:I:52:ILE:HD11	2.03	0.41
1:B:24:LEU:N	1:D:139:ASP:O	2.48	0.41
1:B:94:ASP:OD1	1:B:95:SER:N	2.54	0.41
2:E:26:THR:HG22	2:E:121:GLY:O	2.20	0.41
2:C:161:GLU:OE2	3:G:441:TYR:OH	2.38	0.41
2:F:128:ALA:HB2	2:F:137:LEU:HD11	2.03	0.41
3:G:374:GLN:NE2	3:G:420:GLU:OE1	2.53	0.41
3:G:217:ILE:HD11	3:G:440:PHE:HE1	1.87	0.40
1:D:110:LEU:C	1:D:110:LEU:HD23	2.46	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	336/1152 (29%)	333 (99%)	3 (1%)	0	100	100
1	B	163/1152 (14%)	162 (99%)	1 (1%)	0	100	100
1	D	164/1152 (14%)	162 (99%)	2 (1%)	0	100	100
2	C	101/173 (58%)	98 (97%)	3 (3%)	0	100	100
2	E	170/173 (98%)	164 (96%)	6 (4%)	0	100	100
2	F	159/173 (92%)	157 (99%)	2 (1%)	0	100	100
2	K	146/173 (84%)	142 (97%)	4 (3%)	0	100	100
3	G	251/1019 (25%)	247 (98%)	4 (2%)	0	100	100
4	H	137/640 (21%)	133 (97%)	4 (3%)	0	100	100
4	I	153/640 (24%)	153 (100%)	0	0	100	100
4	J	145/640 (23%)	141 (97%)	4 (3%)	0	100	100
All	All	1925/7087 (27%)	1892 (98%)	33 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	302/1010 (30%)	301 (100%)	1 (0%)	86	85
1	B	147/1010 (15%)	147 (100%)	0	100	100
1	D	148/1010 (15%)	147 (99%)	1 (1%)	76	78

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
2	C	100/153 (65%)	100 (100%)	0	100 100
2	E	152/153 (99%)	152 (100%)	0	100 100
2	F	143/153 (94%)	143 (100%)	0	100 100
2	K	134/153 (88%)	133 (99%)	1 (1%)	76 78
3	G	241/928 (26%)	241 (100%)	0	100 100
4	H	138/577 (24%)	137 (99%)	1 (1%)	76 78
4	I	142/577 (25%)	142 (100%)	0	100 100
4	J	136/577 (24%)	136 (100%)	0	100 100
All	All	1783/6301 (28%)	1779 (100%)	4 (0%)	85 87

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	936	PHE
1	D	92	ASN
4	H	103	TYR
2	K	89	THR

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

Mol	Chain	Res	Type
1	A	822	ASN
1	B	92	ASN
1	B	126	GLN
2	C	157	GLN
1	D	32	GLN
2	E	157	GLN
2	F	136	ASN
2	F	157	GLN
3	G	201	GLN
3	G	255	GLN
3	G	389	ASN
4	J	42	GLN
4	J	172	ASN
4	J	397	ASN

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

There are no ligands in this entry.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

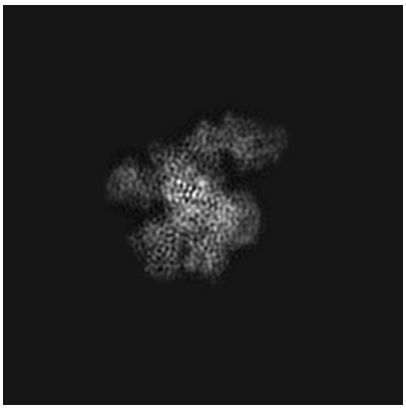
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-55963. These allow visual inspection of the internal detail of the map and identification of artifacts.

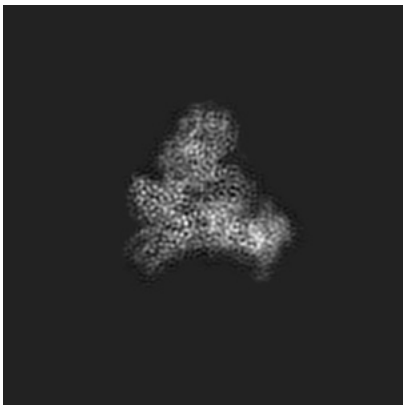
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

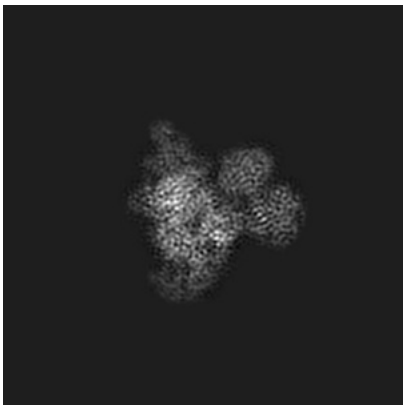
6.1.1 Primary map



X

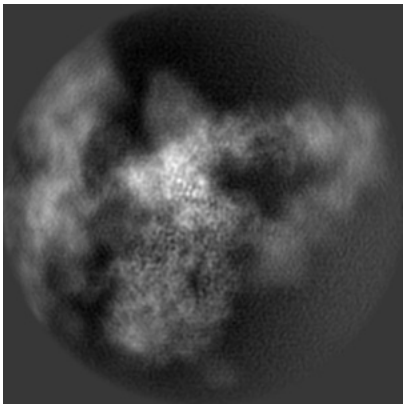


Y

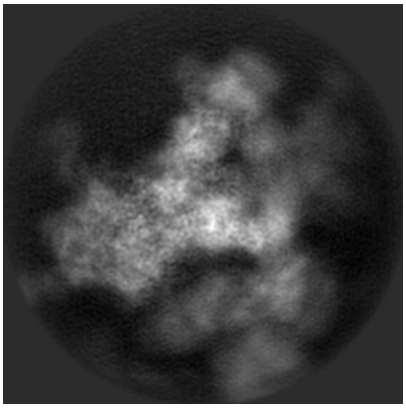


Z

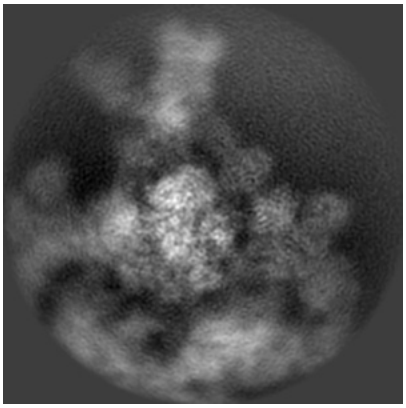
6.1.2 Raw map



X



Y

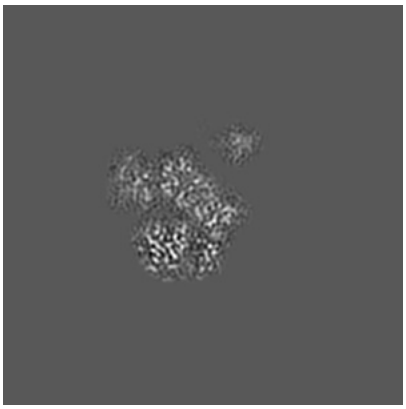


Z

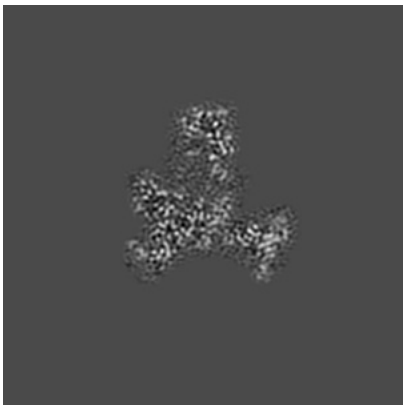
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

6.2.1 Primary map



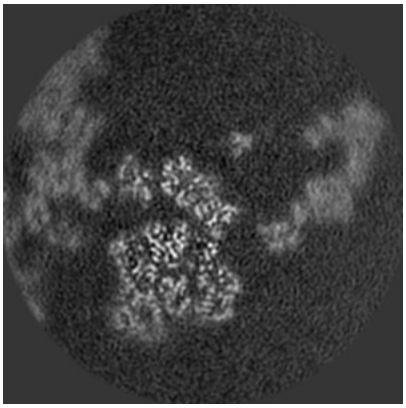
X Index: 90



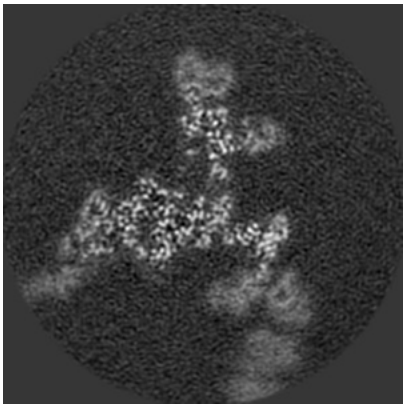
Y Index: 90

Z Index: 90

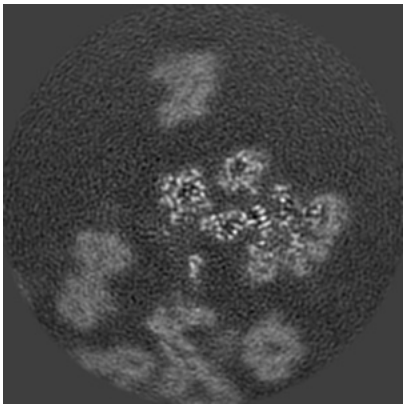
6.2.2 Raw map



X Index: 90



Y Index: 90



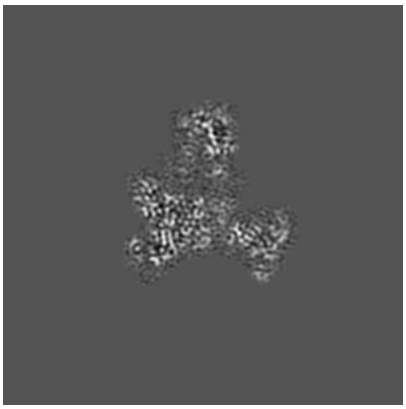
Z Index: 90

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

6.3 Largest variance slices (i)

6.3.1 Primary map

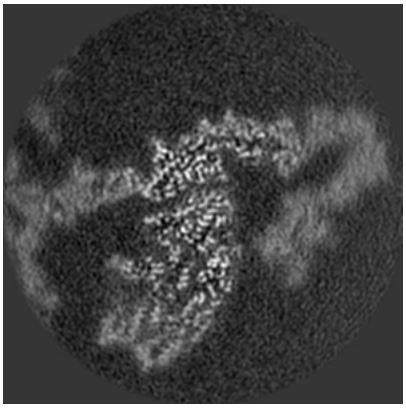
X Index: 78



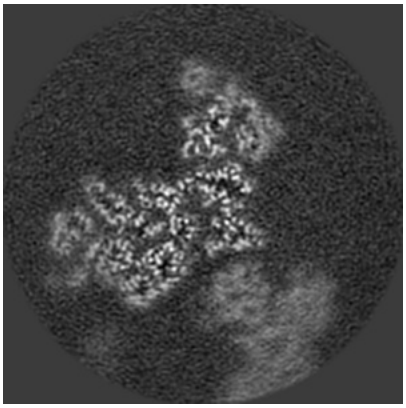
Y Index: 91

Z Index: 94

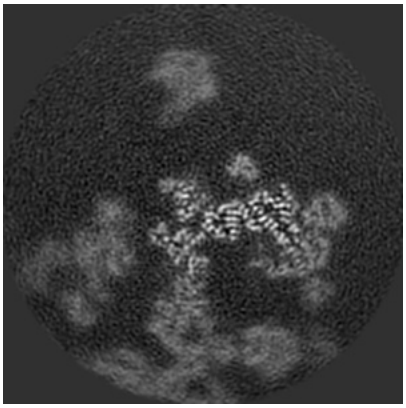
6.3.2 Raw map



X Index: 78



Y Index: 78

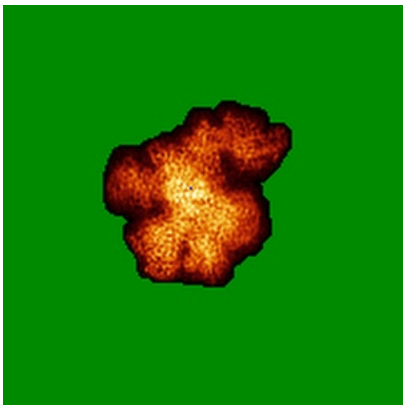


Z Index: 94

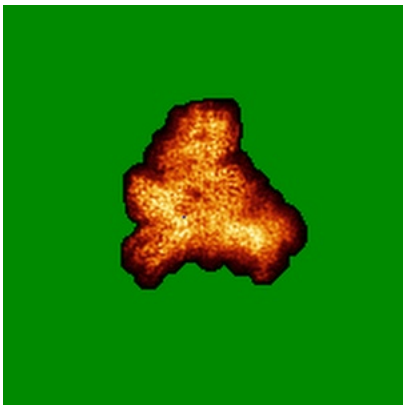
The images above show the largest variance slices of the map in three orthogonal directions.

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

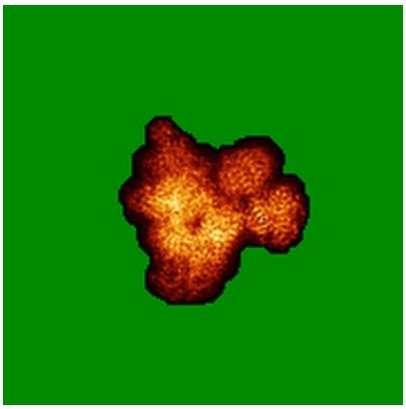
6.4.1 Primary map



X

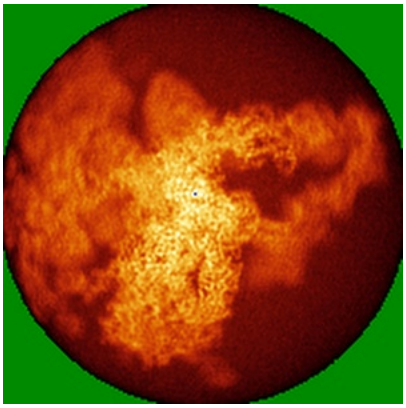


Y

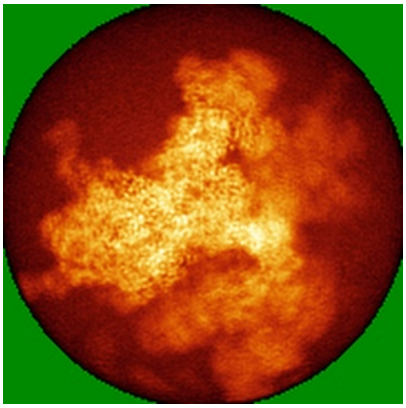


Z

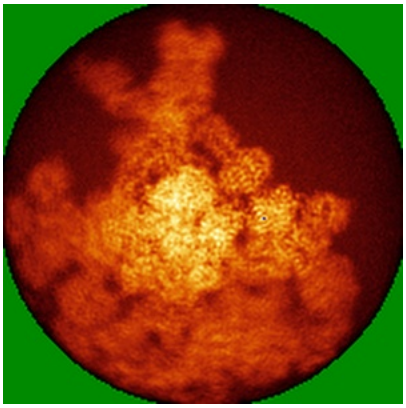
6.4.2 Raw map



X



Y

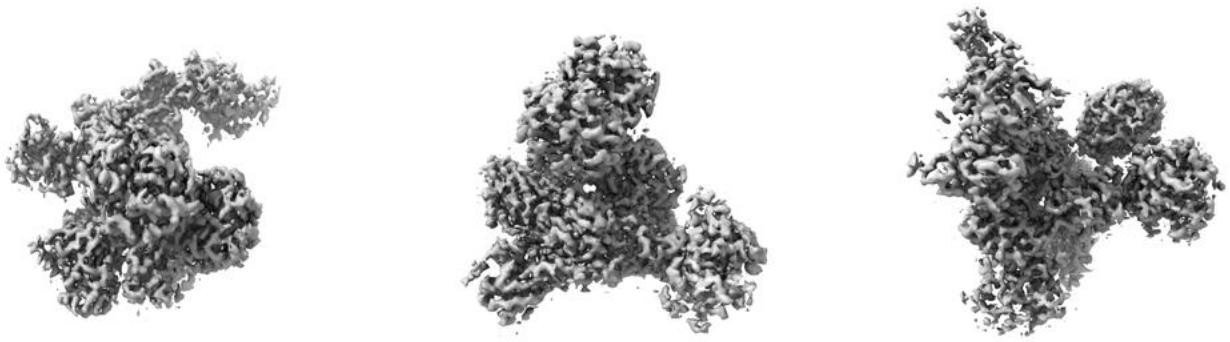


Z

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 0.04. 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.

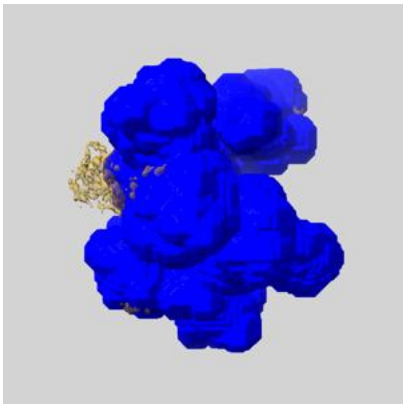
6.6 Mask visualisation (i)

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

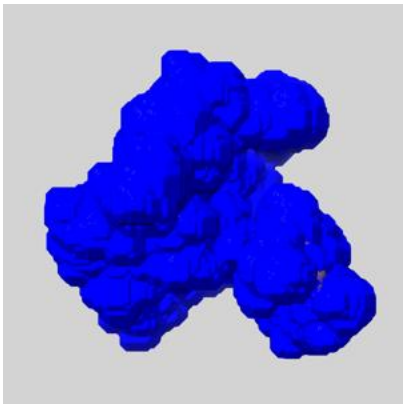
A mask typically either:

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

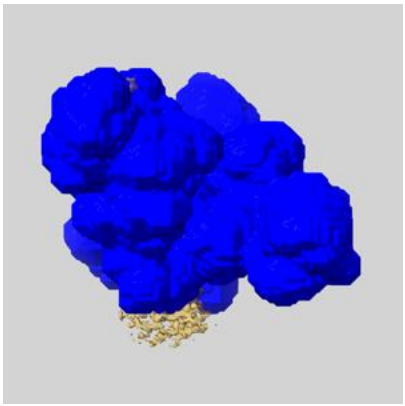
6.6.1 emd_55963_msk_1.map (i)



X



Y

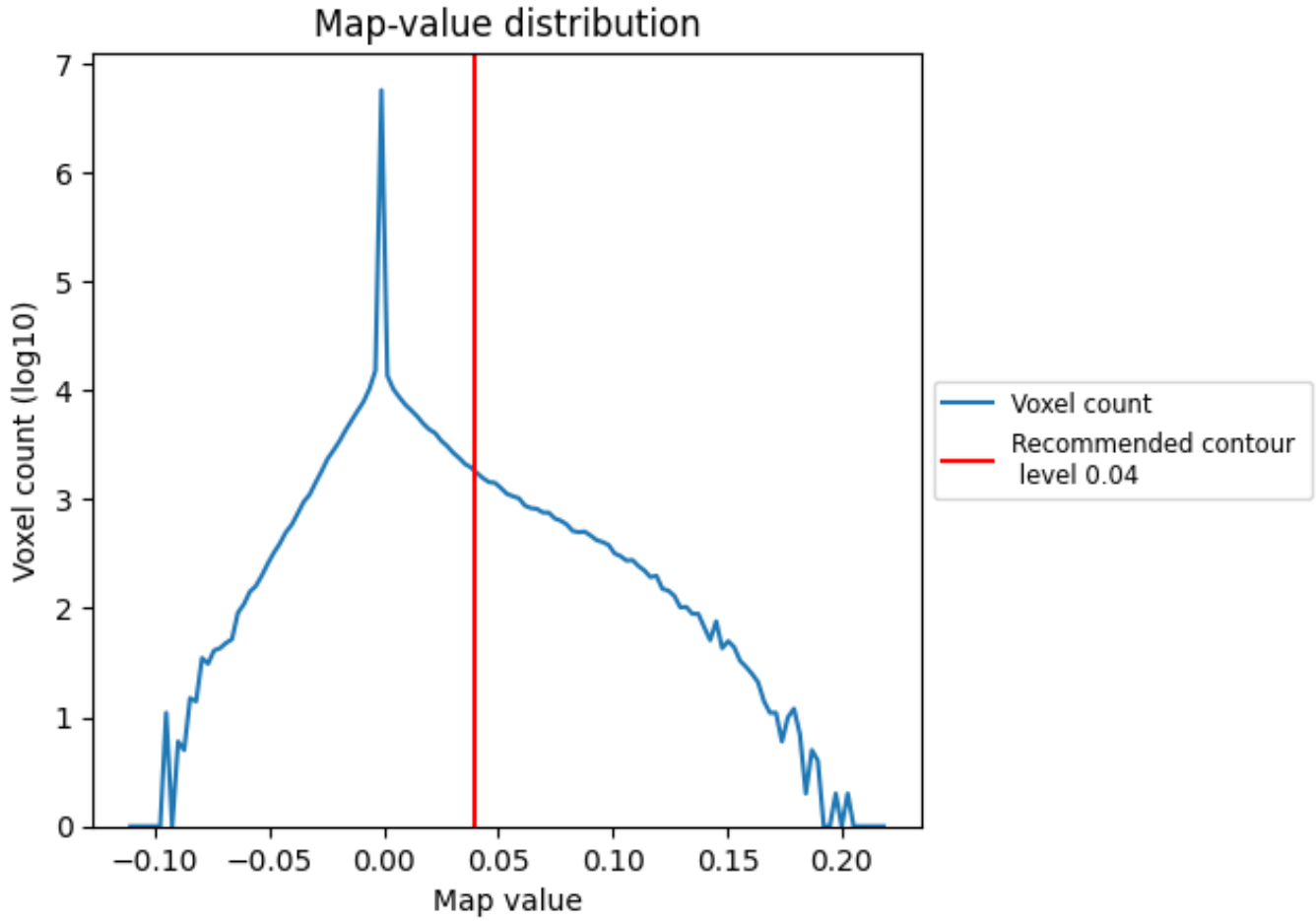


Z

7 Map analysis

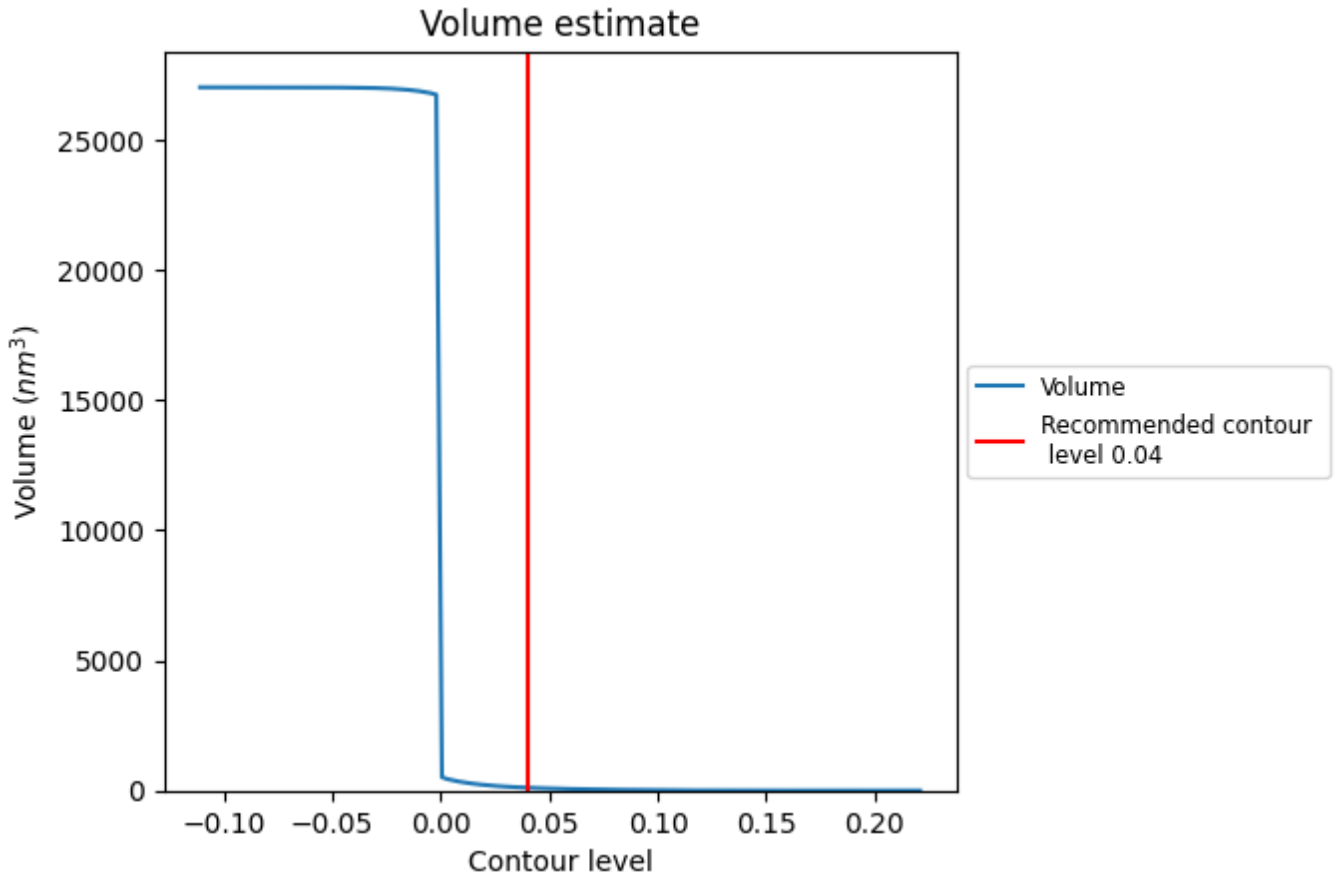
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution



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

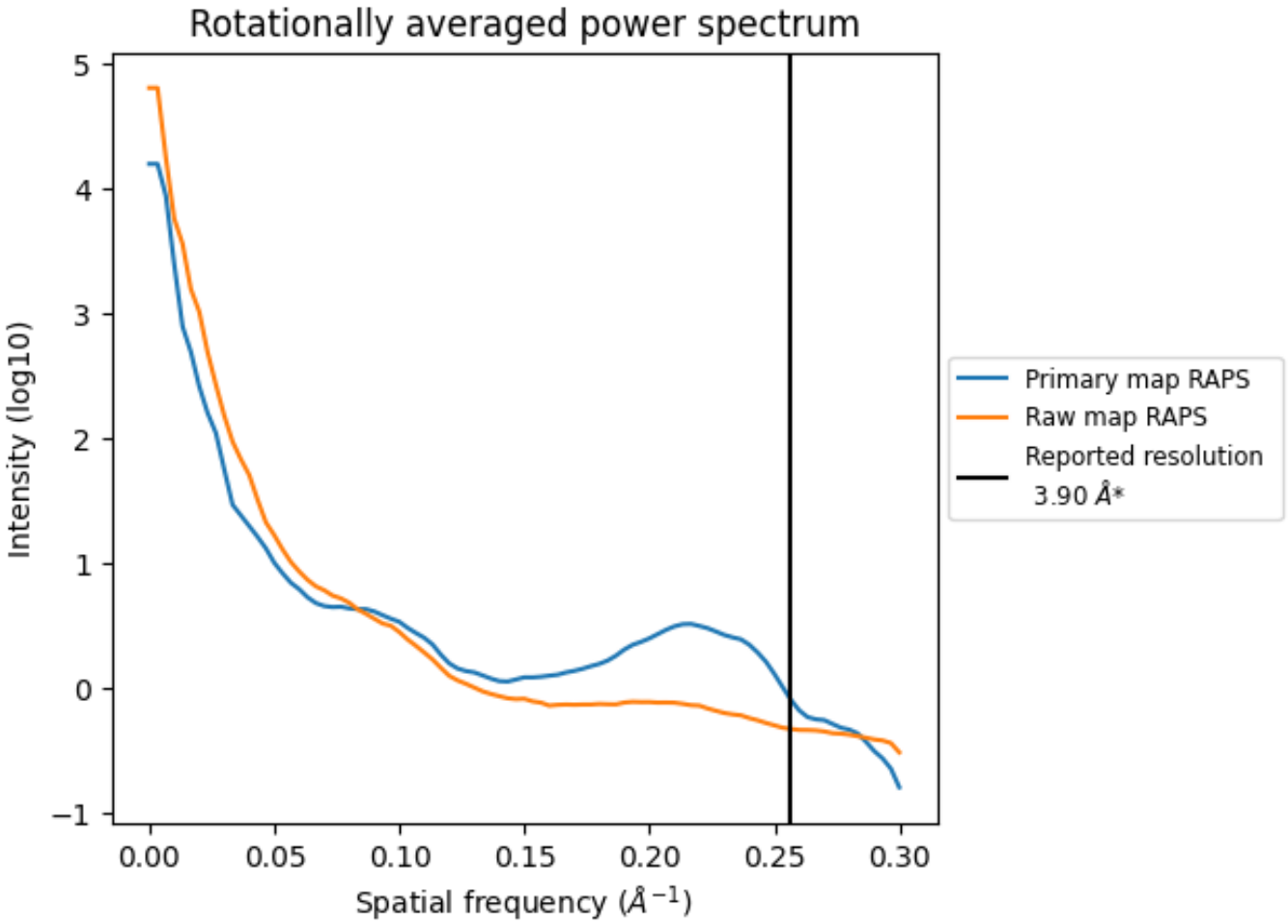
7.2 Volume estimate



The volume at the recommended contour level is 109 nm^3; this corresponds to an approximate mass of 99 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)

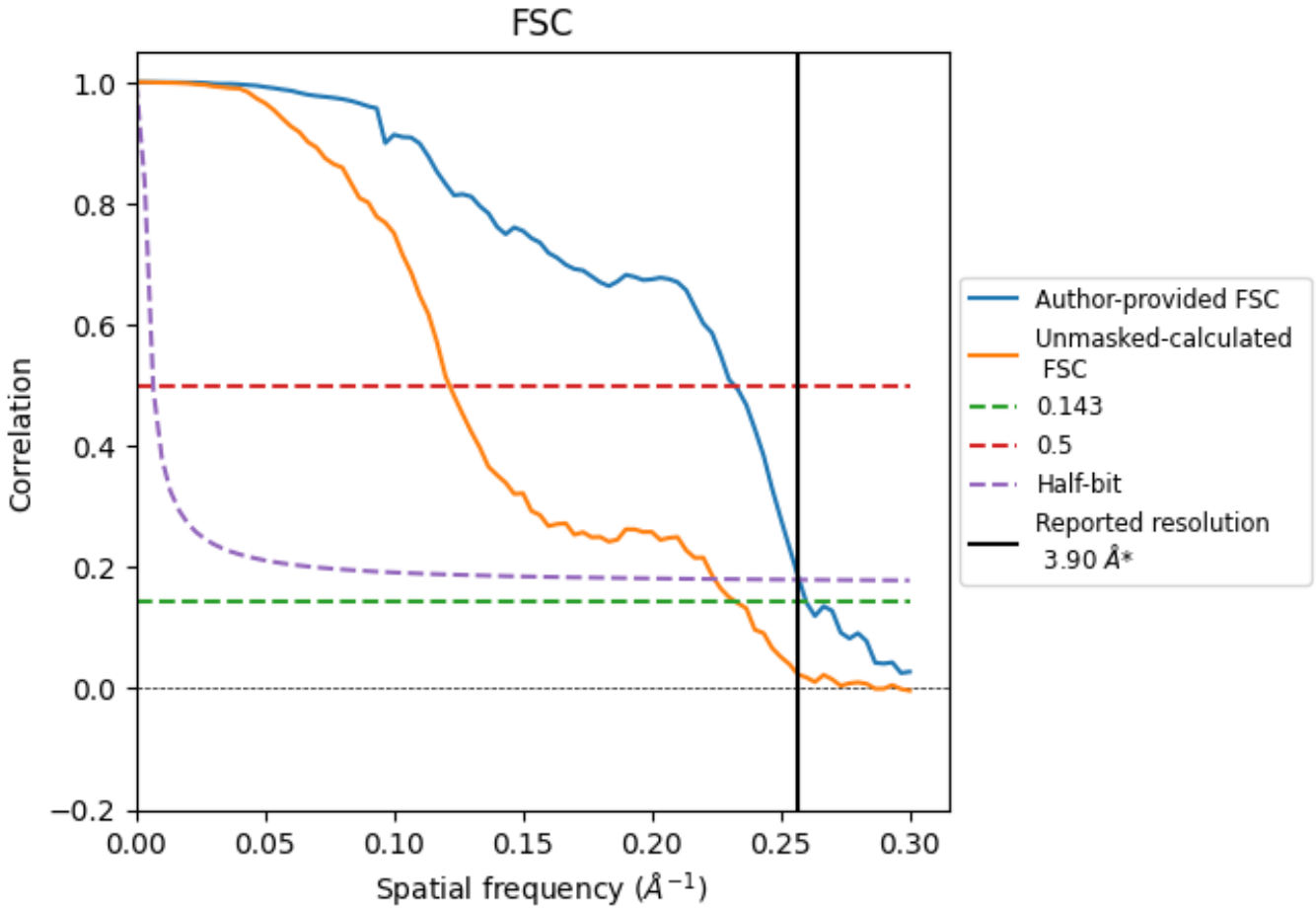


*Reported resolution corresponds to spatial frequency of 0.256 Å^{-1}

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 0.256 Å^{-1}

8.2 Resolution estimates (i)

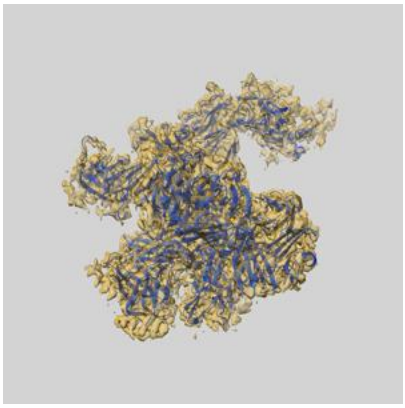
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.90	-	-
Author-provided FSC curve	3.85	4.31	3.89
Unmasked-calculated*	4.30	8.24	4.46

*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 4.30 differs from the reported value 3.9 by more than 10 %

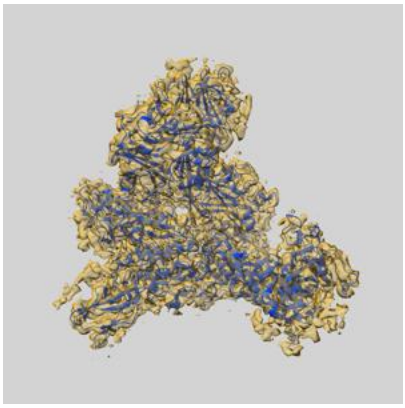
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-55963 and PDB model 9TIO. Per-residue inclusion information can be found in section 3 on page 6.

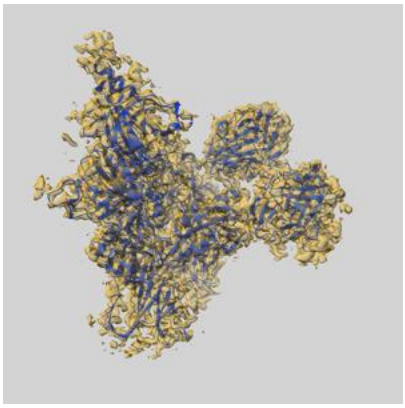
9.1 Map-model overlay



X



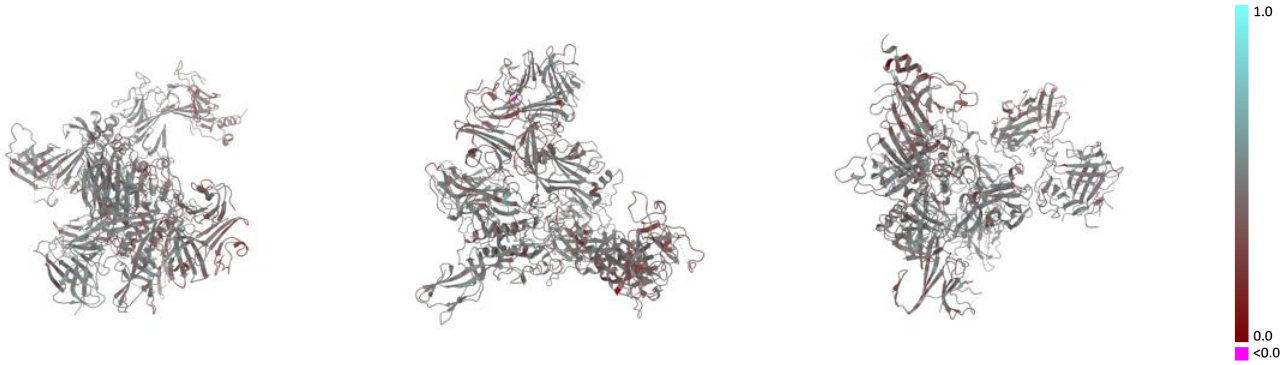
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.04 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.

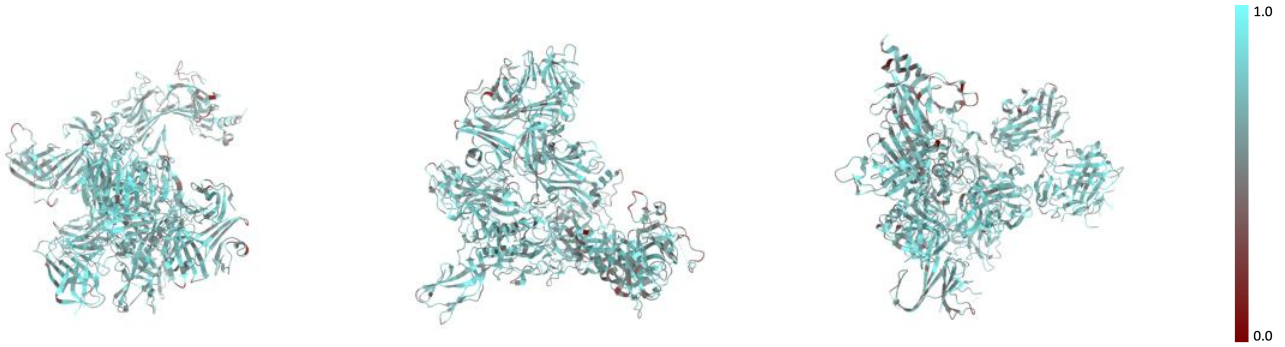
9.2 Q-score mapped to coordinate model (i)



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.

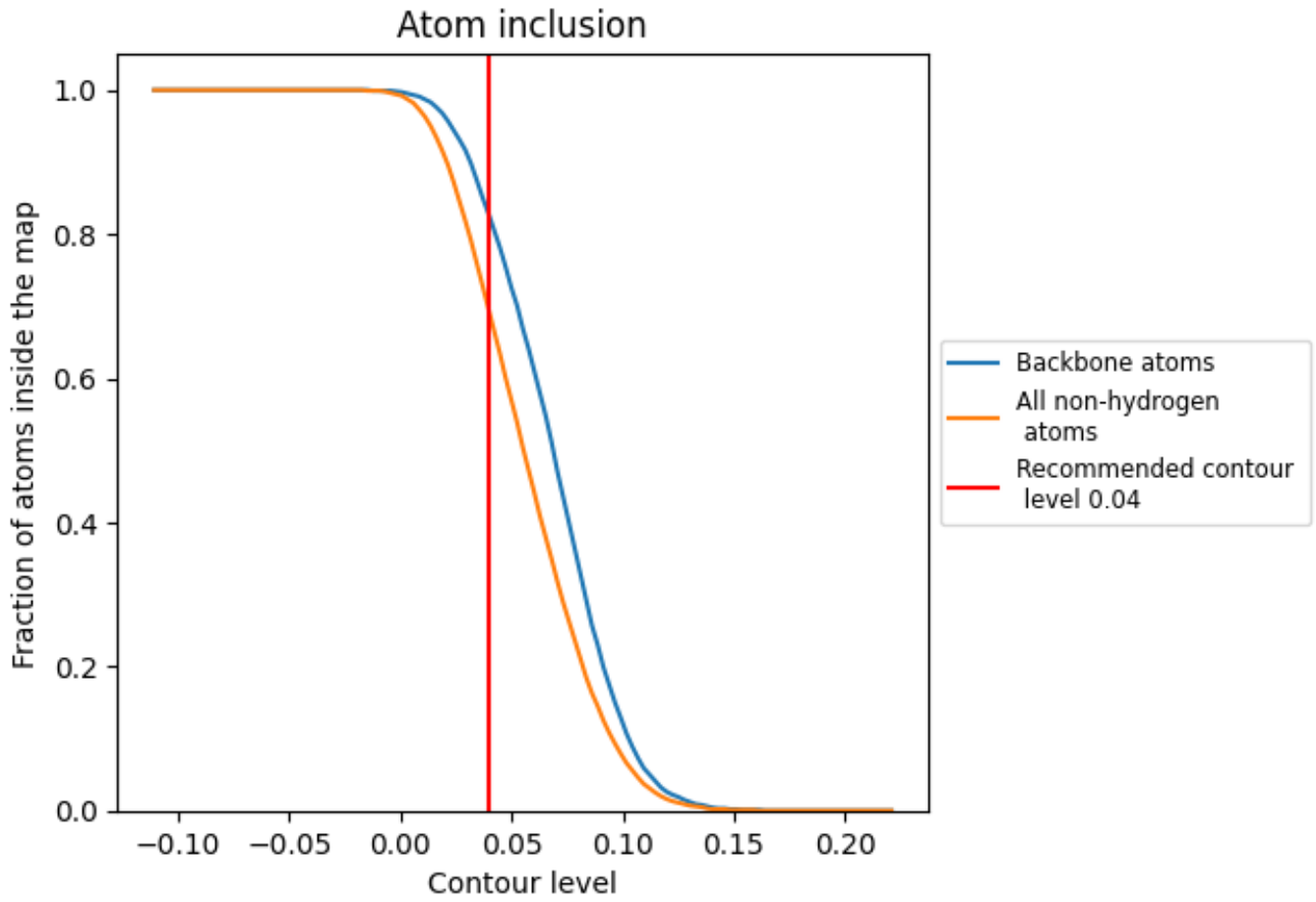
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.04).

9.4 Atom inclusion (i)



At the recommended contour level, 82% of all backbone atoms, 69% 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 (0.04) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6910	0.4440
A	0.7120	0.4670
B	0.6950	0.4550
C	0.6220	0.4270
D	0.7020	0.4600
E	0.6810	0.4400
F	0.7060	0.4500
G	0.7320	0.4620
H	0.6750	0.4120
I	0.7150	0.4500
J	0.6850	0.4250
K	0.5980	0.3920