Full wwPDB EM Validation Report ⓘ

Jun 1, 2025 – 10:19 PM JST

PDB ID	:	8XSO / pdb_00008xso
EMDB ID	:	EMD-38624
Title	:	RNA polymerase II elongation complex transcribing genomic DNA extracted from human nuclei
Authors	:	Kujirai, T.; Kato, J.; Yamamoto, K.; Hirai, S.; Negishi, L.; Ogasawara, M.; Takizawa, Y.; Kurumizaka, H.
Deposited on	:	2024-01-09
Resolution	:	2.70 Å(reported)

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

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

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

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

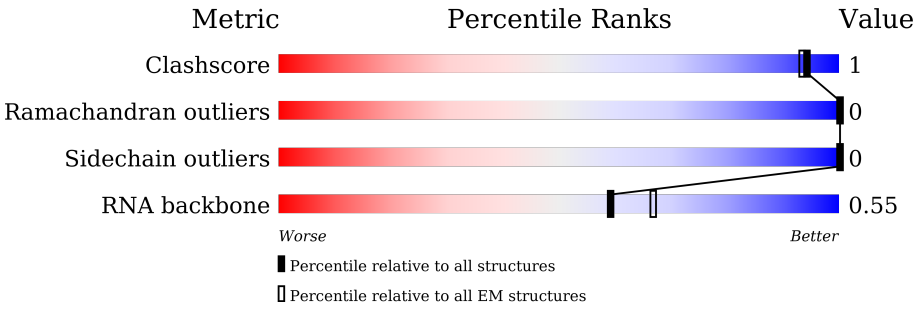
EMDB validation analysis	:	0.0.1.dev118
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

1 Overall quality at a glance

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

The reported resolution of this entry is 2.70 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415
RNA backbone	6643	2191

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1970	69% · 28%
2	B	1174	94% · ·
3	C	292	85% · 12%
4	D	142	77% 89% 11%
5	E	210	97% ·
6	F	127	61% · 36%
7	G	172	59% 96% · ·

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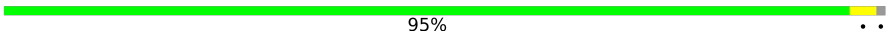
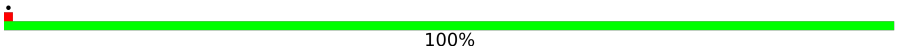
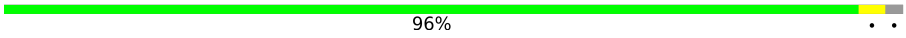
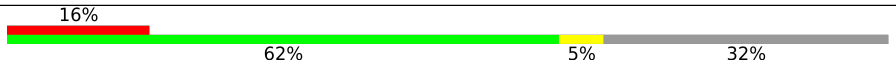
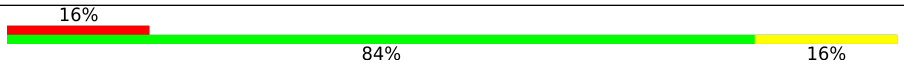
Mol	Chain	Length	Quality of chain
8	H	150	
9	I	125	
10	J	67	
11	K	117	
12	L	58	
13	N	37	
14	P	11	
15	T	37	

2 Entry composition (i)

There are 17 unique types of molecules in this entry. The entry contains 32521 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 DNA-directed RNA polymerase II subunit RPB1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1420	11254	7079	2014	2089	72	0	0

- Molecule 2 is a protein called DNA-directed RNA polymerase II subunit RPB2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	1134	9062	5732	1595	1671	64	0	0

- Molecule 3 is a protein called DNA-directed RNA polymerase II subunit RPB3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	257	2060	1296	351	407	6	0	0

There are 17 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-16	MET	-	initiating methionine	UNP P19387
C	-15	HIS	-	expression tag	UNP P19387
C	-14	HIS	-	expression tag	UNP P19387
C	-13	HIS	-	expression tag	UNP P19387
C	-12	HIS	-	expression tag	UNP P19387
C	-11	HIS	-	expression tag	UNP P19387
C	-10	HIS	-	expression tag	UNP P19387
C	-9	ASP	-	expression tag	UNP P19387
C	-8	TYR	-	expression tag	UNP P19387
C	-7	LYS	-	expression tag	UNP P19387
C	-6	ASP	-	expression tag	UNP P19387
C	-5	ASP	-	expression tag	UNP P19387
C	-4	ASP	-	expression tag	UNP P19387
C	-3	ASP	-	expression tag	UNP P19387
C	-2	LYS	-	expression tag	UNP P19387

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-1	GLY	-	expression tag	UNP P19387
C	0	HIS	-	expression tag	UNP P19387

- Molecule 4 is a protein called DNA-directed RNA polymerase II subunit RPB4.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	126	Total	C	N	O	S	0	0
			991	624	170	193	4		

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	209	Total	C	N	O	S	0	0
			1715	1083	300	324	8		

- Molecule 6 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	81	Total	C	N	O	S	0	0
			649	414	111	119	5		

- Molecule 7 is a protein called DNA-directed RNA polymerase II subunit RPB7.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	171	Total	C	N	O	S	0	0
			1337	868	217	244	8		

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	148	Total	C	N	O	S	0	0
			1186	750	194	237	5		

- Molecule 9 is a protein called DNA-directed RNA polymerase II subunit RPB9.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	114	Total	C	N	O	S	0	0
			927	571	166	179	11		

- Molecule 10 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	J	67	Total	C	N	O	S	0	0
			533	345	90	92	6		

- Molecule 11 is a protein called DNA-directed RNA polymerase II subunit RPB11-a.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	K	115	Total	C	N	O	S	0	0
			920	593	152	173	2		

- Molecule 12 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC4.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	L	44	Total	C	N	O	S	0	0
			372	231	72	63	6		

- Molecule 13 is a DNA chain called DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
13	N	25	Total	C	N	O	P	0	0
			511	246	84	156	25		

- Molecule 14 is a RNA chain called RNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
14	P	11	Total	C	N	O	P	0	0
			237	106	46	74	11		

- Molecule 15 is a DNA chain called DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
15	T	37	Total	C	N	O	P	0	0
			758	362	139	220	37		

- Molecule 16 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
16	A	2	Total	Zn	0
			2	2	
16	B	1	Total	Zn	0
			1	1	
16	C	1	Total	Zn	0
			1	1	

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Mol	Chain	Residues	Atoms	AltConf
16	I	2	Total Zn 2 2	0
16	J	1	Total Zn 1 1	0
16	L	1	Total Zn 1 1	0

- Molecule 17 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

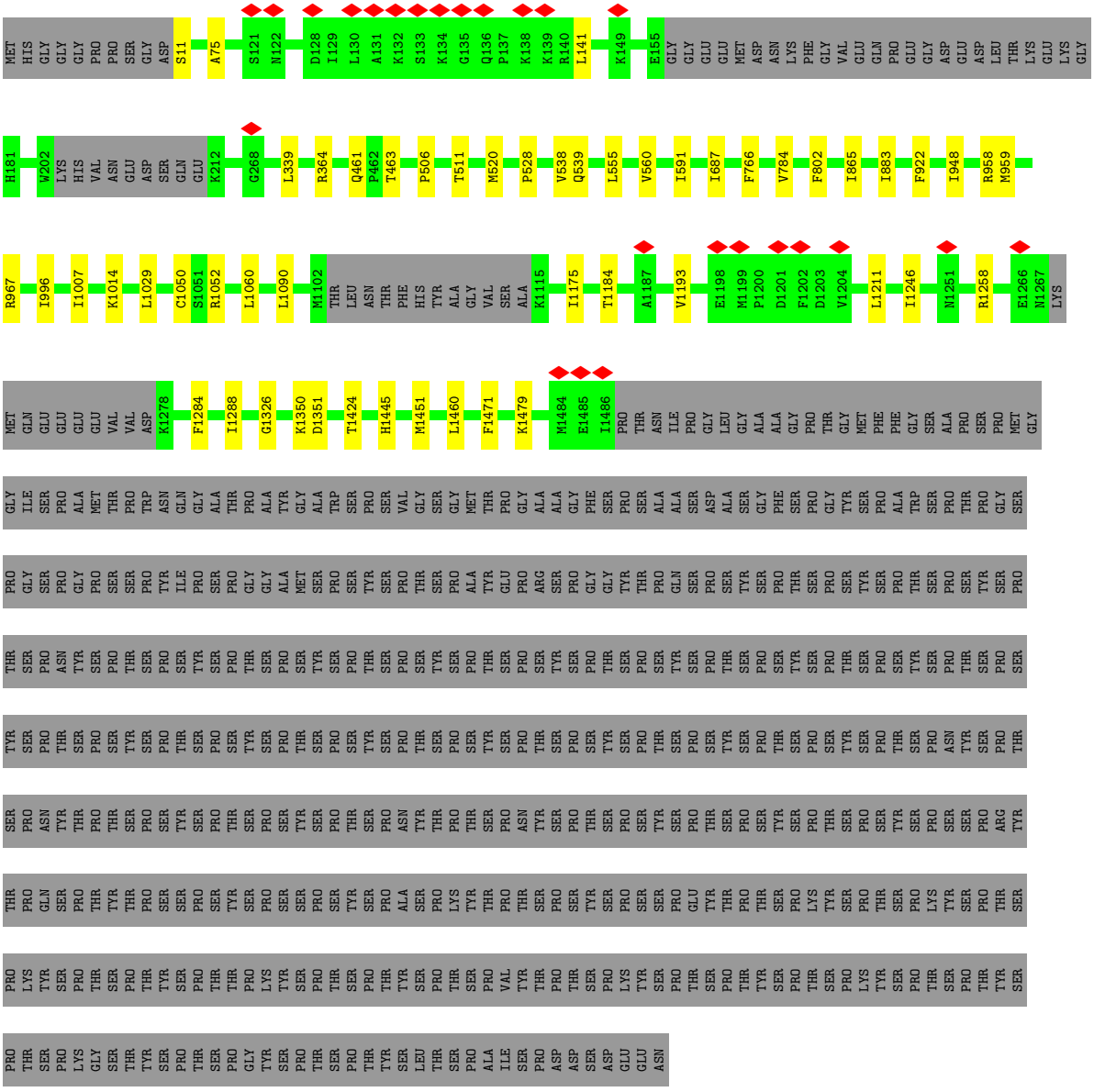
Mol	Chain	Residues	Atoms	AltConf
17	A	1	Total Mg 1 1	0

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.

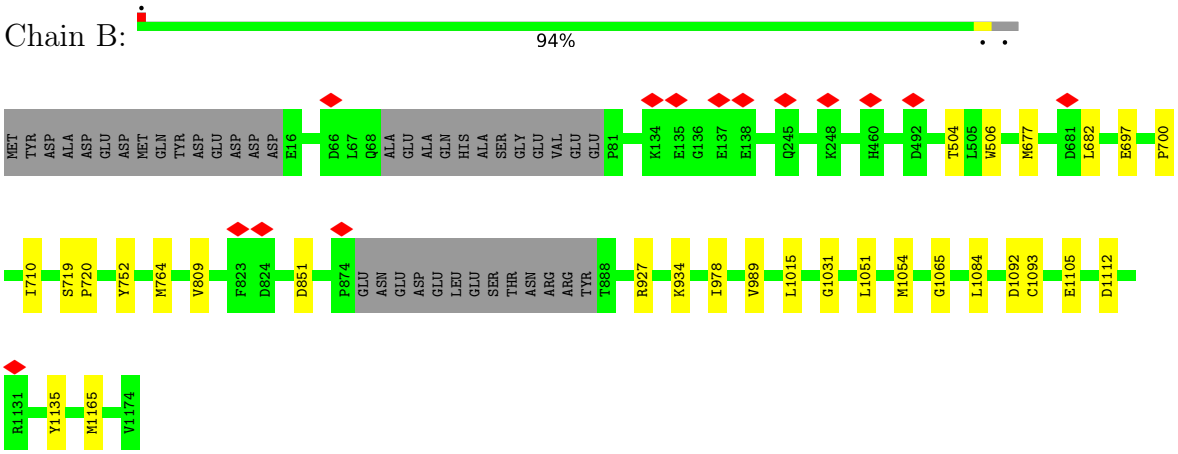
• Molecule 1: DNA-directed RNA polymerase II subunit RPB1

Chain A:



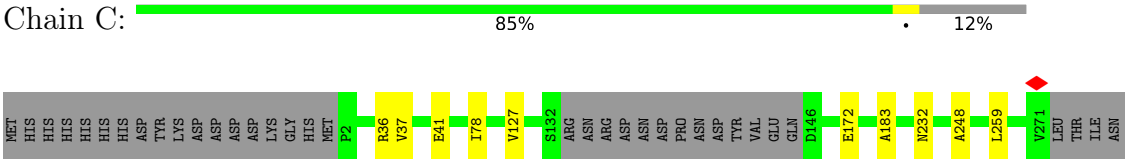
• Molecule 2: DNA-directed RNA polymerase II subunit RPB2

Chain B:



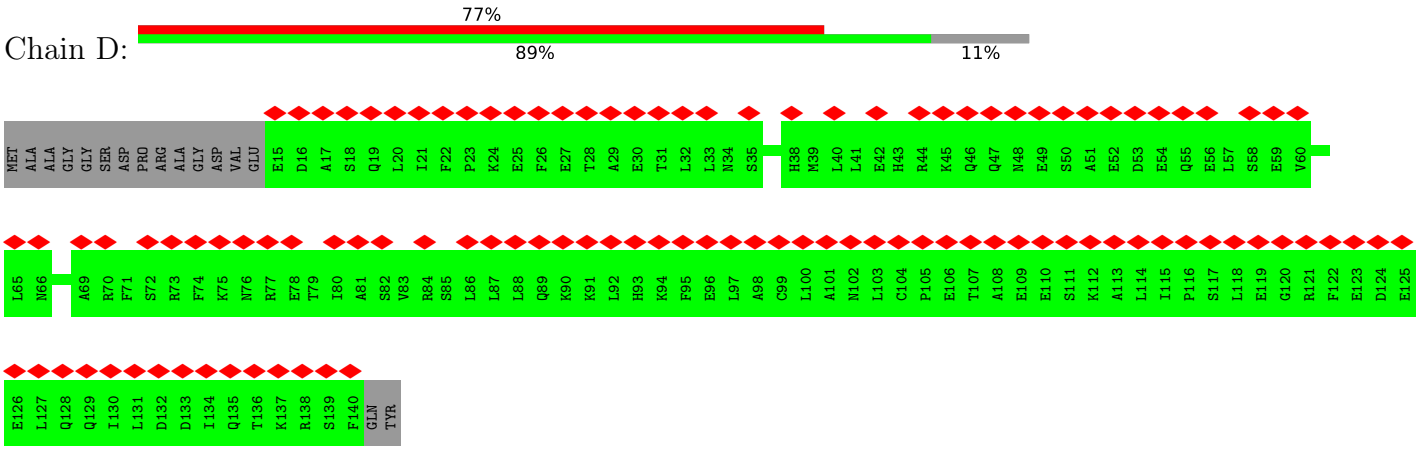
• Molecule 3: DNA-directed RNA polymerase II subunit RPB3

Chain C:



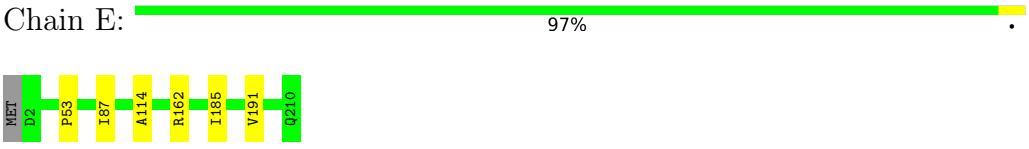
• Molecule 4: DNA-directed RNA polymerase II subunit RPB4

Chain D:



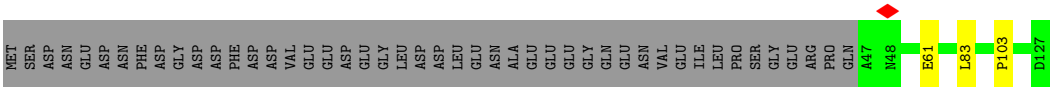
• Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC1

Chain E:

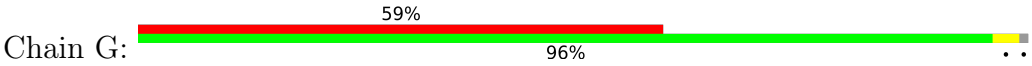


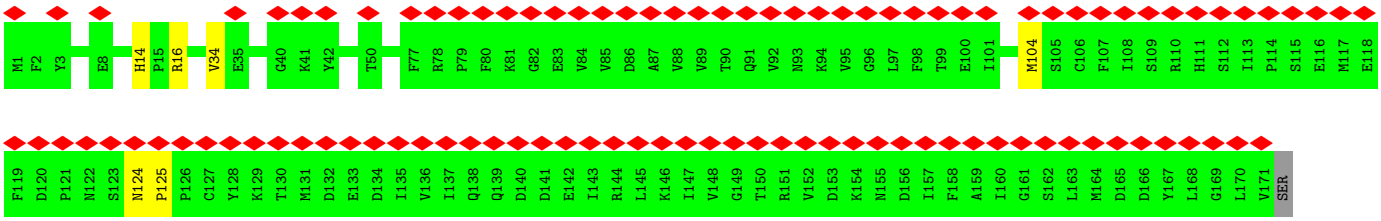
• Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC2

Chain F:

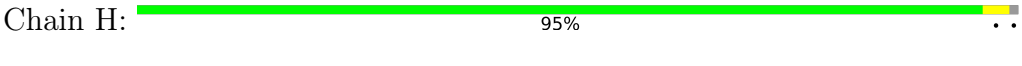


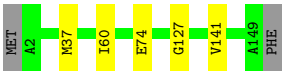
• Molecule 7: DNA-directed RNA polymerase II subunit RPB7



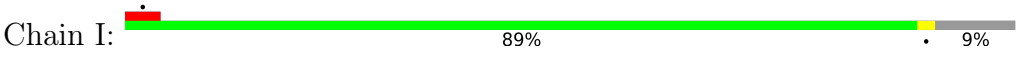


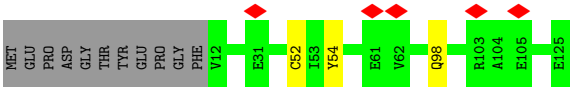
• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC3





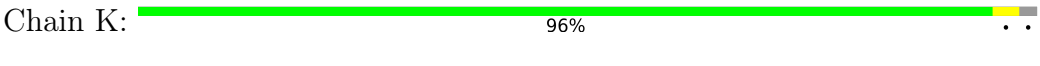
• Molecule 9: DNA-directed RNA polymerase II subunit RPB9



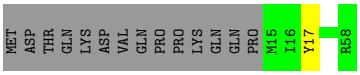


• Molecule 10: DNA-directed RNA polymerases I, II, and III subunit RPABC5

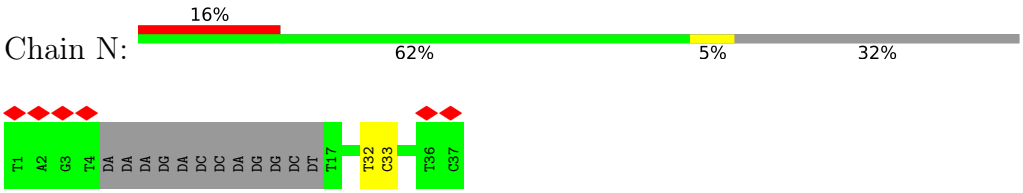
• Molecule 11: DNA-directed RNA polymerase II subunit RPB11-a



• Molecule 12: DNA-directed RNA polymerases I, II, and III subunit RPABC4

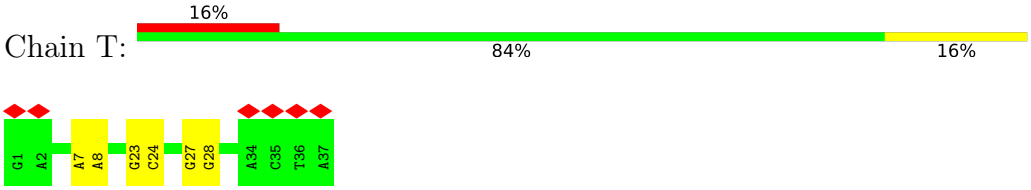


• Molecule 13: DNA



• Molecule 14: RNA

• Molecule 15: DNA



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	523284	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 ($e^-/Å^2$)	60	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.062	Depositor
Minimum map value	-0.021	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.001	Depositor
Recommended contour level	0.0077	Depositor
Map size (Å)	381.59998, 381.59998, 381.59998	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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

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	0.47	0/11459	0.83	5/15467 (0.0%)
2	B	0.44	0/9243	0.78	2/12475 (0.0%)
3	C	0.53	0/2103	0.92	0/2858
4	D	0.78	0/1005	1.28	0/1355
5	E	0.43	0/1745	0.77	1/2358 (0.0%)
6	F	0.45	0/659	0.74	0/891
7	G	0.81	0/1368	1.24	2/1857 (0.1%)
8	H	0.47	0/1207	0.82	0/1628
9	I	0.70	0/948	1.11	3/1284 (0.2%)
10	J	0.57	0/542	0.91	0/730
11	K	0.42	0/939	0.75	0/1271
12	L	0.85	0/377	1.28	0/500
13	N	0.48	0/569	0.97	2/874 (0.2%)
14	P	0.58	0/265	0.77	0/411
15	T	0.40	0/850	0.73	0/1309
All	All	0.51	0/33279	0.87	15/45268 (0.0%)

There are no bond length outliers.

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	A	75	ALA	CA-C-N	7.38	127.01	119.92
1	A	75	ALA	C-N-CA	7.38	127.01	119.92
1	A	520	MET	CA-C-N	6.49	125.52	120.33
1	A	520	MET	C-N-CA	6.49	125.52	120.33
2	B	1065	GLY	CA-C-N	6.28	126.25	119.78
2	B	1065	GLY	C-N-CA	6.28	126.25	119.78
1	A	461	GLN	N-CA-C	5.99	121.67	113.16
5	E	53	PRO	N-CA-CB	5.88	106.65	102.65
7	G	104	MET	N-CA-C	5.38	118.18	109.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
13	N	32	DT	C2'-C3'-O3'	-5.25	103.62	111.50
9	I	98	GLN	N-CA-C	5.20	117.23	110.53
7	G	34	VAL	N-CA-C	5.18	115.85	110.82
9	I	52	CYS	CA-C-N	5.14	127.64	121.84
9	I	52	CYS	C-N-CA	5.14	127.64	121.84
13	N	33	DC	C2'-C3'-O3'	-5.09	103.87	111.50

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	11254	0	11383	35	0
2	B	9062	0	9107	21	0
3	C	2060	0	2011	8	0
4	D	991	0	956	0	0
5	E	1715	0	1733	3	0
6	F	649	0	678	4	0
7	G	1337	0	1337	2	0
8	H	1186	0	1147	3	0
9	I	927	0	860	1	0
10	J	533	0	553	0	0
11	K	920	0	942	3	0
12	L	372	0	378	1	0
13	N	511	0	288	0	0
14	P	237	0	121	2	0
15	T	758	0	418	5	0
16	A	2	0	0	0	0
16	B	1	0	0	0	0
16	C	1	0	0	0	0
16	I	2	0	0	0	0
16	J	1	0	0	0	0
16	L	1	0	0	0	0
17	A	1	0	0	0	0
All	All	32521	0	31912	72	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 (72) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1246:ILE:HG21	1:A:1258:ARG:NH2	2.09	0.68
1:A:141:LEU:HD13	1:A:1445:HIS:HE1	1.60	0.67
3:C:183:ALA:HB3	3:C:232:ASN:HB3	1.77	0.66
1:A:784:VAL:HG13	2:B:978:ILE:HD11	1.79	0.64
15:T:7:DA:H4'	15:T:8:DA:OP1	1.97	0.64
3:C:78:ILE:HD11	3:C:127:VAL:HG11	1.82	0.62
2:B:710:ILE:HA	2:B:764:MET:HE2	1.80	0.62
1:A:802:PHE:CE1	2:B:504:THR:HG22	2.35	0.61
3:C:37:VAL:HG13	3:C:41:GLU:HB2	1.83	0.61
7:G:124:ASN:HB2	7:G:125:PRO:HD3	1.86	0.58
1:A:339:LEU:HB3	2:B:1165:MET:HE2	1.86	0.57
6:F:83:LEU:H	6:F:83:LEU:HD23	1.73	0.54
14:P:1:A:H2'	14:P:2:A:O4'	2.08	0.54
2:B:1031:GLY:O	3:C:36:ARG:NH2	2.39	0.54
2:B:677:MET:HE2	2:B:700:PRO:HB3	1.89	0.53
1:A:1211:LEU:HD11	1:A:1258:ARG:CG	2.39	0.53
15:T:23:DG:H2'	15:T:24:DC:C6	2.44	0.53
2:B:851:ASP:OD2	12:L:17:TYR:OH	2.27	0.52
15:T:23:DG:H2'	15:T:24:DC:H6	1.74	0.52
14:P:6:C:H2'	14:P:7:A:C8	2.44	0.52
2:B:934:LYS:HG2	2:B:1051:LEU:HD12	1.91	0.51
1:A:687:ILE:HD11	1:A:766:PHE:CD1	2.45	0.51
15:T:27:DG:H2'	15:T:28:DG:C8	2.45	0.50
1:A:511:THR:HG21	2:B:1105:GLU:OE1	2.11	0.50
1:A:996:ILE:HD13	1:A:1060:LEU:HA	1.94	0.49
1:A:560:VAL:HG22	1:A:591:ILE:HD11	1.94	0.49
1:A:1451:MET:CE	1:A:1460:LEU:HD12	2.43	0.48
2:B:989:VAL:HG22	2:B:1015:LEU:HB2	1.94	0.48
2:B:677:MET:HE3	2:B:697:GLU:HG3	1.96	0.48
3:C:41:GLU:OE1	3:C:41:GLU:N	2.46	0.48
1:A:538:VAL:HG12	1:A:539:GLN:HG2	1.95	0.48
1:A:11:SER:N	2:B:1135:TYR:HH	2.12	0.48
3:C:259:LEU:HD22	11:K:19:ILE:HD11	1.95	0.48
2:B:927:ARG:HD3	2:B:1054:MET:SD	2.53	0.47
1:A:958:ARG:HH12	1:A:1014:LYS:HD2	1.77	0.47
1:A:1479:LYS:HD2	6:F:103:PRO:HA	1.97	0.47
1:A:364:ARG:HB2	2:B:1084:LEU:HD11	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:883:ILE:HD11	1:A:1424:THR:HG22	1.97	0.46
1:A:1193:VAL:HG22	1:A:1258:ARG:NH2	2.30	0.46
11:K:7:PHE:HA	11:K:10:PHE:CE1	2.50	0.46
5:E:87:ILE:HD12	5:E:114:ALA:HB1	1.98	0.45
8:H:74:GLU:OE1	8:H:74:GLU:N	2.48	0.45
2:B:719:SER:OG	2:B:720:PRO:HD3	2.16	0.45
1:A:1471:PHE:CZ	6:F:61:GLU:HA	2.52	0.45
1:A:555:LEU:CD1	1:A:591:ILE:HD12	2.47	0.45
1:A:1246:ILE:HB	1:A:1258:ARG:HB3	1.98	0.45
5:E:185:ILE:HD13	5:E:191:VAL:CG1	2.46	0.45
1:A:506:PRO:HB2	1:A:511:THR:HG23	1.98	0.45
8:H:60:ILE:HG23	8:H:141:VAL:HG13	1.99	0.45
8:H:37:MET:HE3	8:H:127:GLY:HA3	1.99	0.44
3:C:172:GLU:HG2	11:K:10:PHE:CE1	2.53	0.44
1:A:967:ARG:NH2	1:A:1326:GLY:O	2.51	0.43
1:A:1246:ILE:O	1:A:1258:ARG:N	2.51	0.43
15:T:7:DA:H2"	15:T:8:DA:O5'	2.18	0.43
1:A:922:PHE:H	1:A:1052:ARG:HD2	1.83	0.43
2:B:677:MET:H	2:B:682:LEU:HD22	1.83	0.43
7:G:14:HIS:CE1	7:G:16:ARG:HE	2.37	0.43
1:A:865:ILE:HG21	2:B:1092:ASP:CG	2.44	0.43
1:A:528:PRO:HG2	1:A:1090:LEU:HD11	2.00	0.43
1:A:1184:THR:HG21	1:A:1193:VAL:HG21	2.01	0.43
2:B:506:TRP:HZ2	2:B:677:MET:HE1	1.83	0.43
1:A:948:ILE:HG12	1:A:1007:ILE:HD11	2.00	0.42
1:A:1175:ILE:HD12	9:I:54:TYR:HD2	1.84	0.42
3:C:37:VAL:HG12	3:C:248:ALA:HB1	2.01	0.42
1:A:1029:LEU:HD23	5:E:162:ARG:HG2	2.01	0.42
2:B:752:TYR:HE1	2:B:809:VAL:HG23	1.85	0.42
2:B:1112:ASP:OD1	2:B:1112:ASP:N	2.54	0.41
1:A:1350:LYS:O	1:A:1351:ASP:HB2	2.21	0.41
6:F:83:LEU:H	6:F:83:LEU:CD2	2.34	0.41
1:A:1284:PHE:CE2	1:A:1288:ILE:HD11	2.56	0.41
1:A:463:THR:HG22	2:B:1093:CYS:SG	2.61	0.40
1:A:959:MET:HE1	1:A:1050:CYS:CB	2.51	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	1410/1970 (72%)	1365 (97%)	45 (3%)	0	100	100
2	B	1128/1174 (96%)	1091 (97%)	37 (3%)	0	100	100
3	C	253/292 (87%)	245 (97%)	8 (3%)	0	100	100
4	D	124/142 (87%)	122 (98%)	2 (2%)	0	100	100
5	E	207/210 (99%)	198 (96%)	9 (4%)	0	100	100
6	F	79/127 (62%)	79 (100%)	0	0	100	100
7	G	169/172 (98%)	164 (97%)	5 (3%)	0	100	100
8	H	146/150 (97%)	142 (97%)	4 (3%)	0	100	100
9	I	112/125 (90%)	106 (95%)	6 (5%)	0	100	100
10	J	65/67 (97%)	63 (97%)	2 (3%)	0	100	100
11	K	113/117 (97%)	110 (97%)	3 (3%)	0	100	100
12	L	42/58 (72%)	37 (88%)	5 (12%)	0	100	100
All	All	3848/4604 (84%)	3722 (97%)	126 (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	1251/1748 (72%)	1251 (100%)	0	100	100
2	B	993/1028 (97%)	993 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
3	C	234/268 (87%)	234 (100%)	0	100	100
4	D	105/126 (83%)	105 (100%)	0	100	100
5	E	191/192 (100%)	191 (100%)	0	100	100
6	F	70/111 (63%)	70 (100%)	0	100	100
7	G	148/153 (97%)	148 (100%)	0	100	100
8	H	129/131 (98%)	129 (100%)	0	100	100
9	I	103/112 (92%)	103 (100%)	0	100	100
10	J	56/56 (100%)	56 (100%)	0	100	100
11	K	104/106 (98%)	104 (100%)	0	100	100
12	L	41/55 (74%)	41 (100%)	0	100	100
All	All	3425/4086 (84%)	3425 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (28) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	143	HIS
1	A	313	HIS
1	A	372	ASN
1	A	472	HIS
1	A	673	GLN
1	A	740	GLN
1	A	765	ASN
1	A	780	ASN
1	A	861	GLN
1	A	1032	GLN
1	A	1230	GLN
1	A	1417	HIS
2	B	145	GLN
2	B	319	ASN
2	B	968	ASN
2	B	1097	HIS
2	B	1117	HIS
2	B	1160	GLN
3	C	18	ASN
3	C	66	HIS
3	C	260	GLN

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Mol	Chain	Res	Type
4	D	38	HIS
4	D	43	HIS
5	E	35	GLN
5	E	169	GLN
7	G	21	ASN
7	G	138	GLN
11	K	55	GLN

5.3.3 RNA

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
14	P	10/11 (90%)	0	0

There are no RNA backbone outliers to report.

There are no RNA pucker outliers to report.

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

Of 9 ligands modelled in this entry, 9 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers (i)

There are no such residues in this entry.

5.8 Polymer linkage issues (i)

There are no chain breaks in this entry.

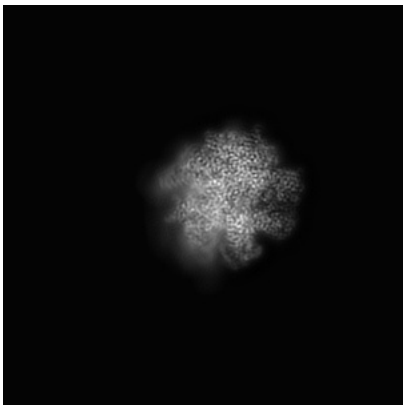
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-38624. These allow visual inspection of the internal detail of the map and identification of artifacts.

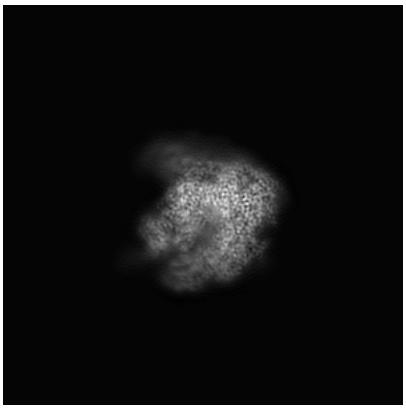
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

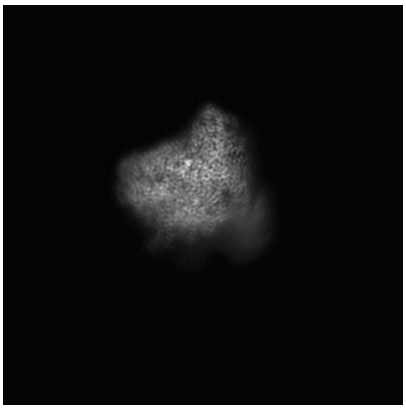
6.1.1 Primary map



X

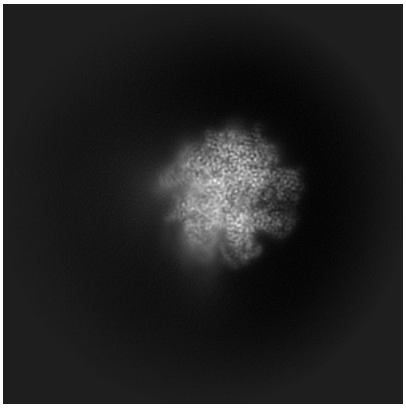


Y

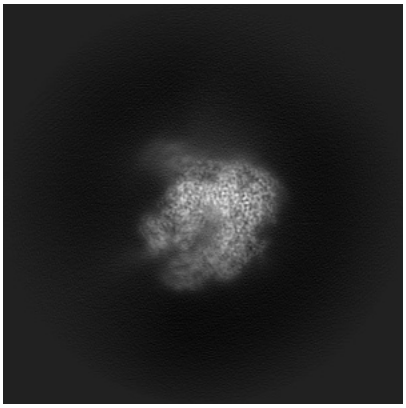


Z

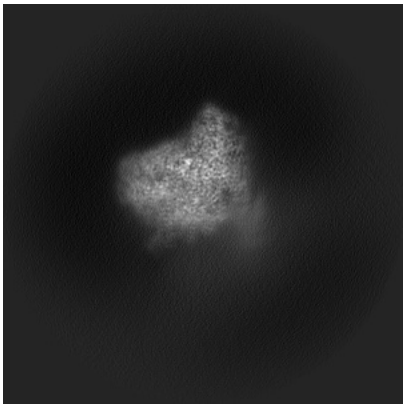
6.1.2 Raw map



X



Y

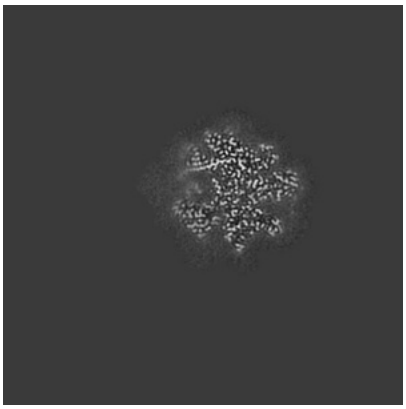


Z

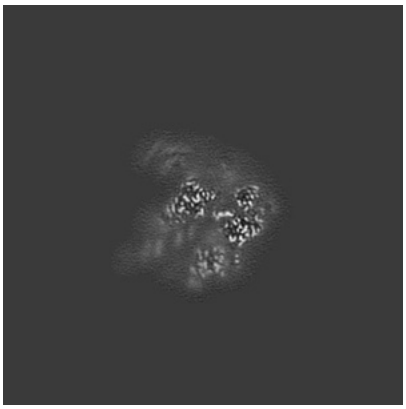
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

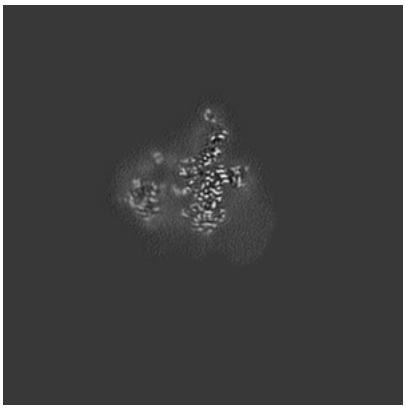
6.2.1 Primary map



X Index: 180

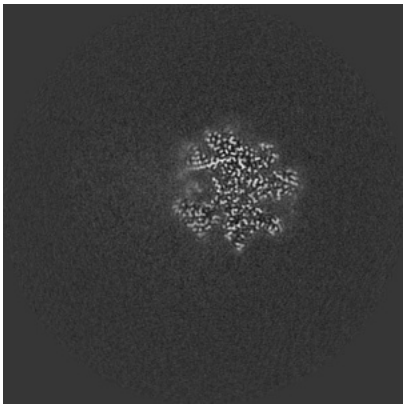


Y Index: 180

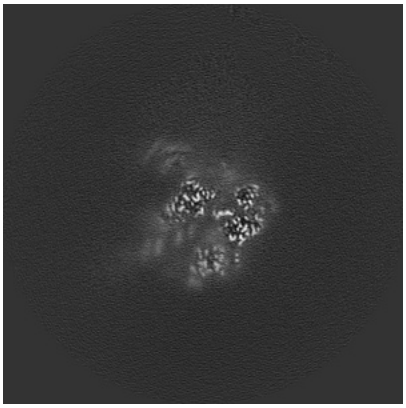


Z Index: 180

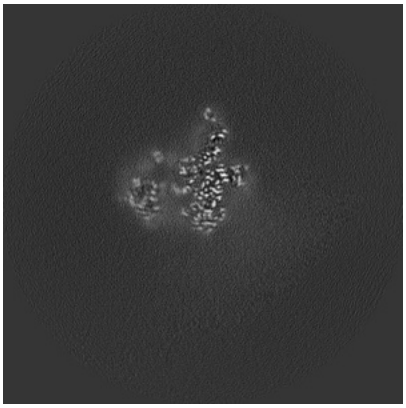
6.2.2 Raw map



X Index: 180



Y Index: 180

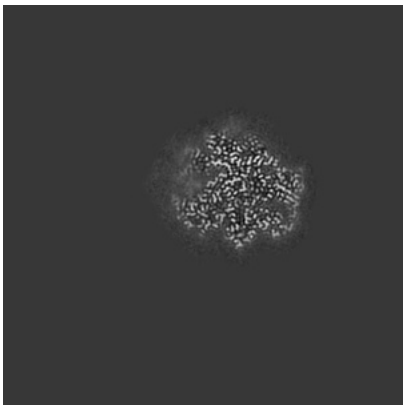


Z Index: 180

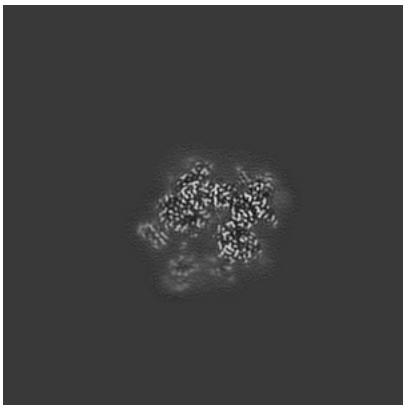
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

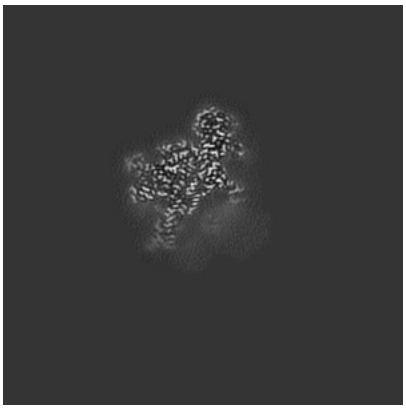
6.3.1 Primary map



X Index: 185

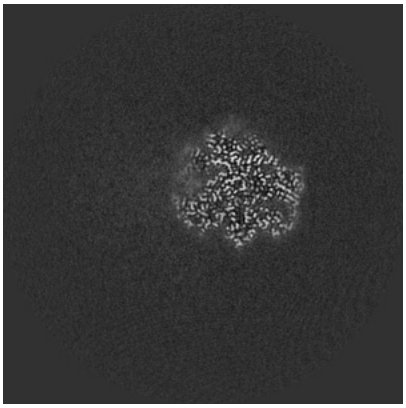


Y Index: 209

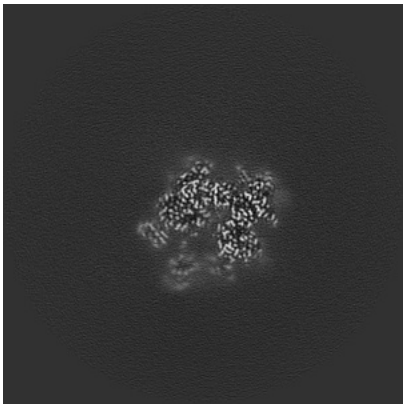


Z Index: 202

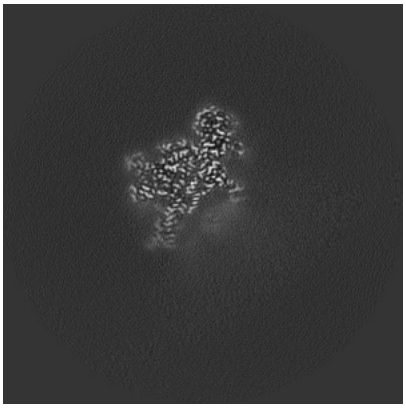
6.3.2 Raw map



X Index: 185



Y Index: 209

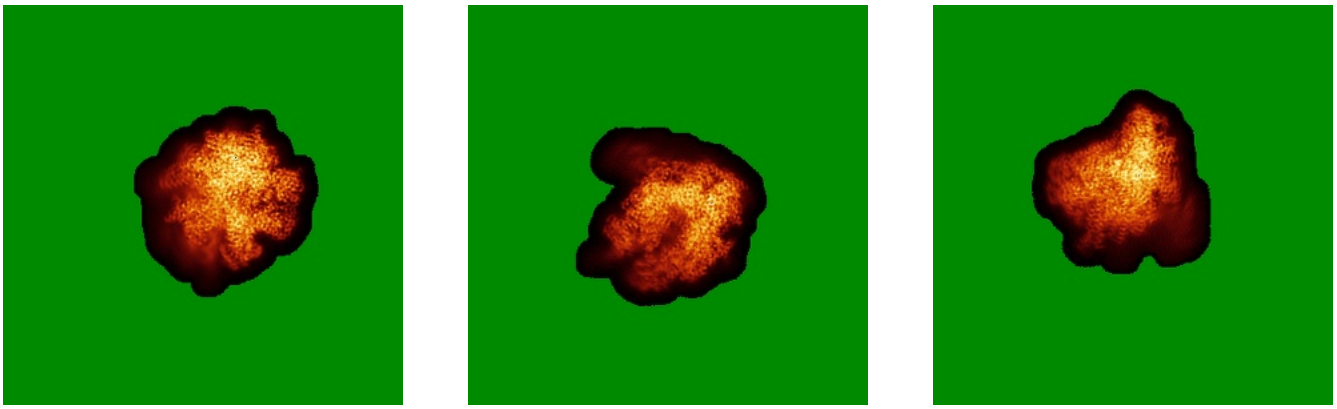


Z Index: 202

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

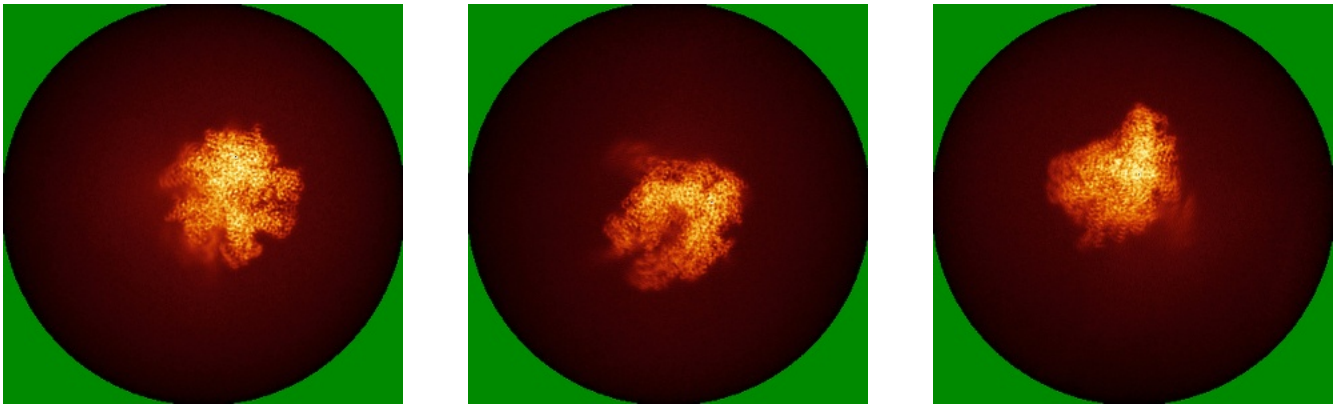
6.4 Orthogonal standard-deviation projections (False-color) (i)

6.4.1 Primary map



X Y Z

6.4.2 Raw map

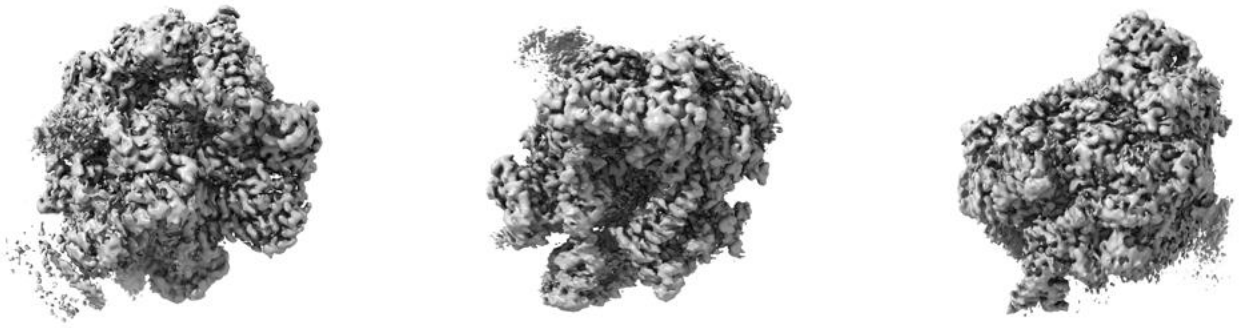


X Y Z

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 0.0077. 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.

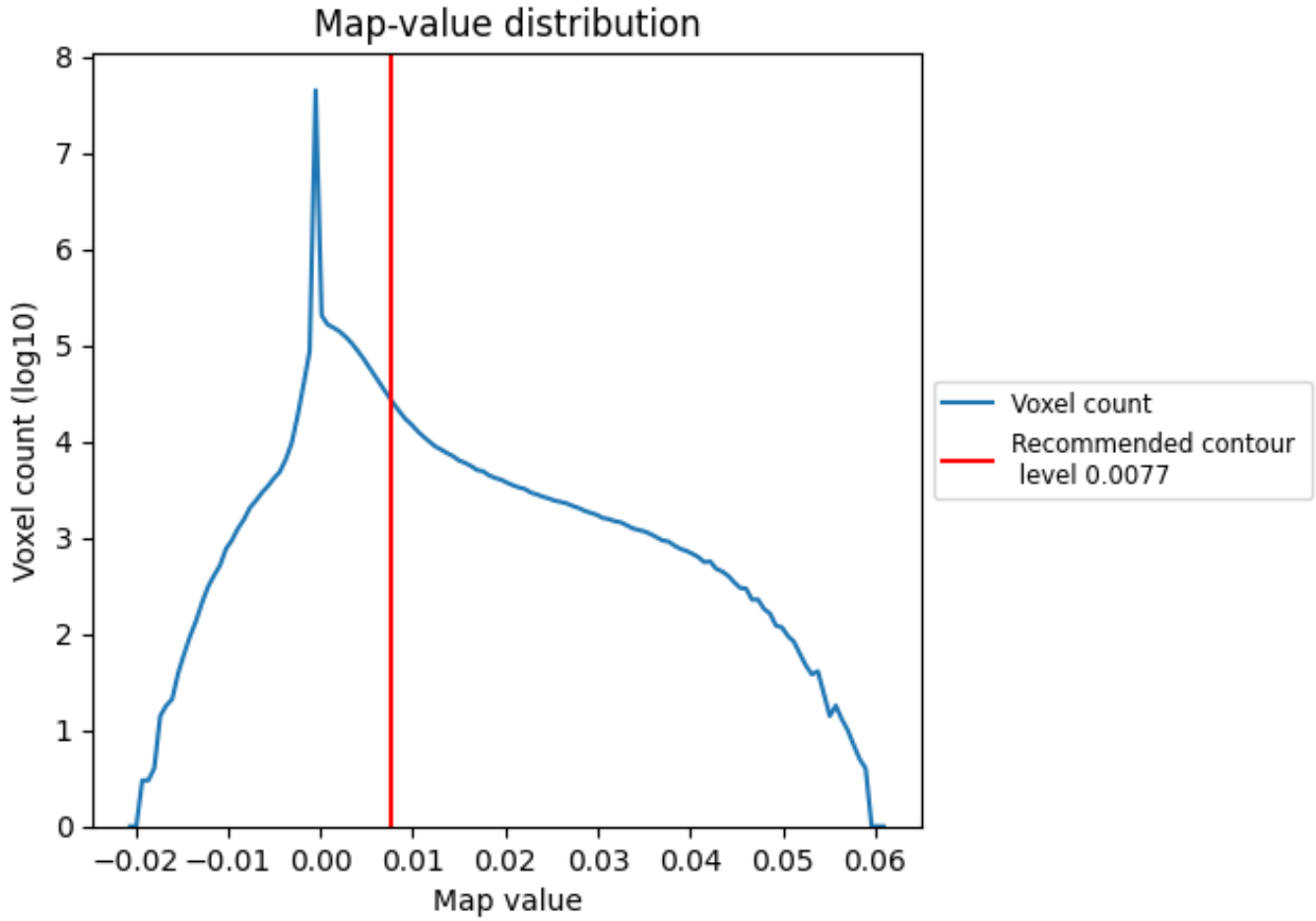
6.6 Mask visualisation (i)

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

7 Map analysis

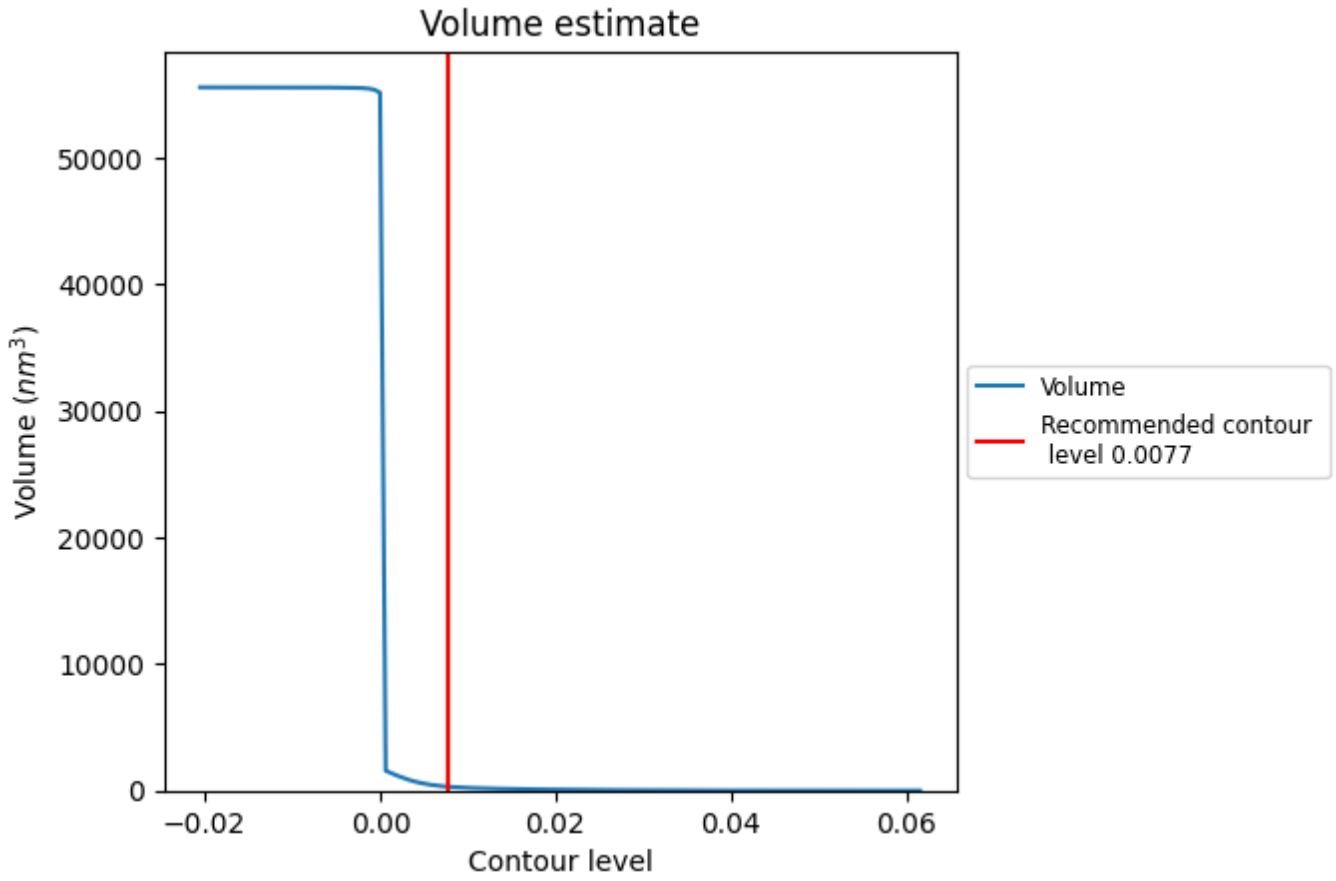
This section contains the results of statistical analysis of the map.

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.

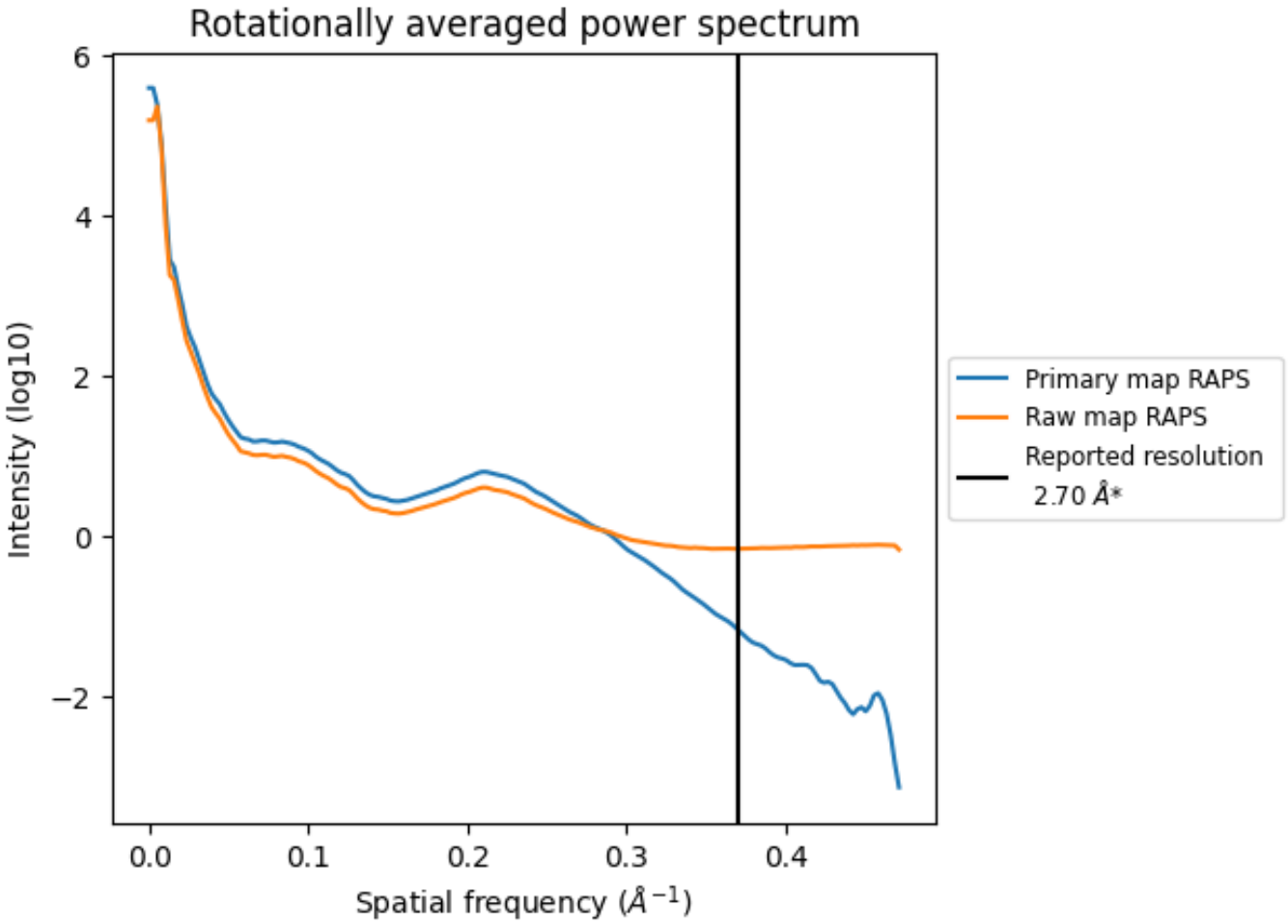
7.2 Volume estimate



The volume at the recommended contour level is 308 nm^3; this corresponds to an approximate mass of 279 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)

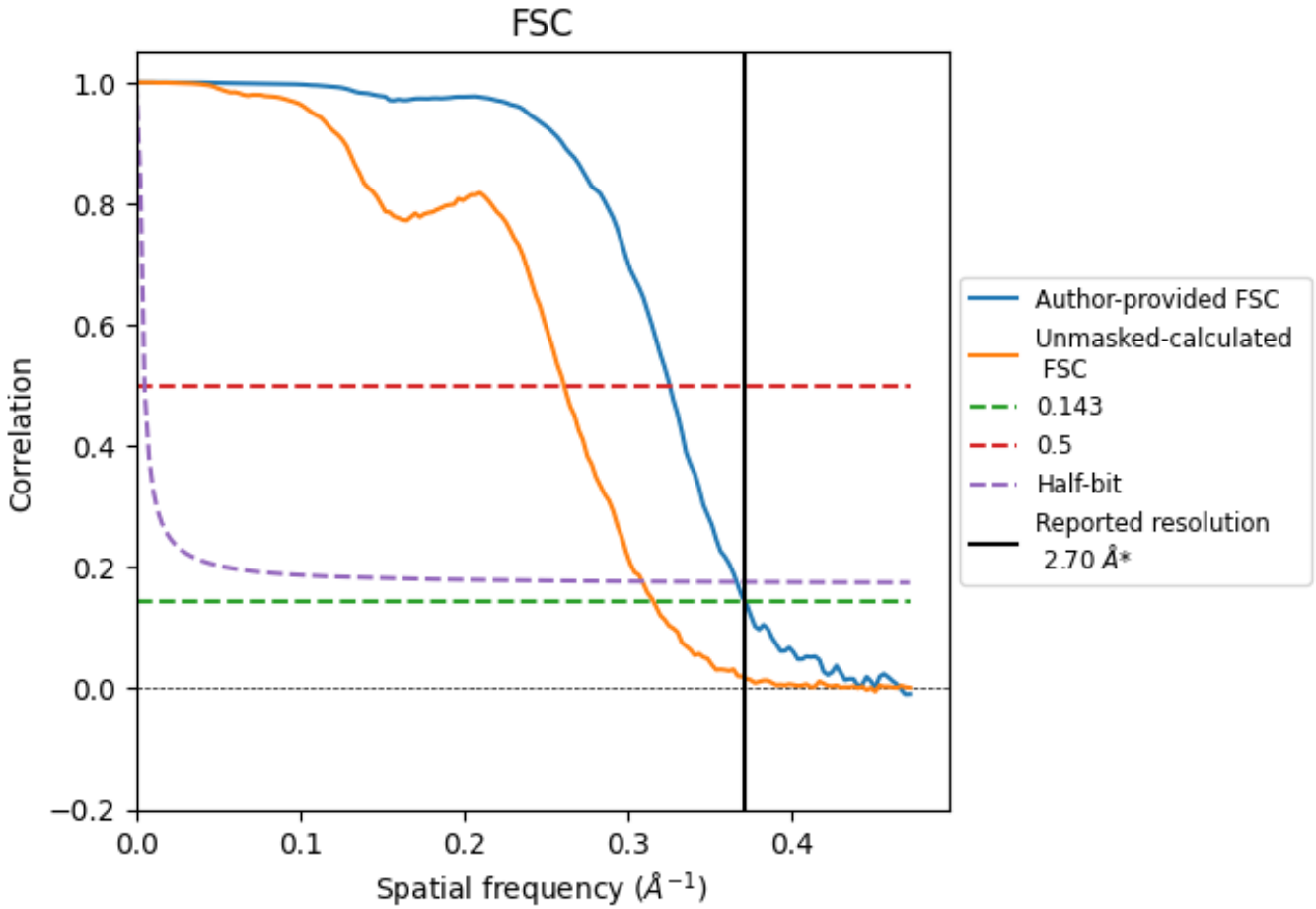


*Reported resolution corresponds to spatial frequency of 0.370 $Å^{-1}$

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 0.370 Å^{-1}

8.2 Resolution estimates (i)

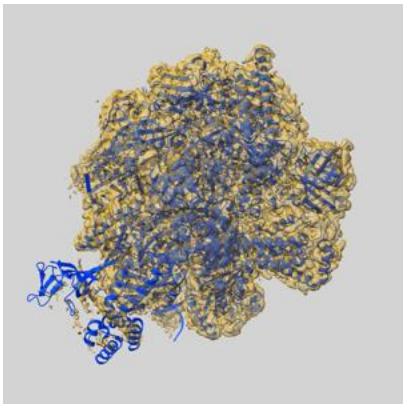
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.70	-	-
Author-provided FSC curve	2.69	3.07	2.73
Unmasked-calculated*	3.17	3.83	3.24

*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 3.17 differs from the reported value 2.7 by more than 10 %

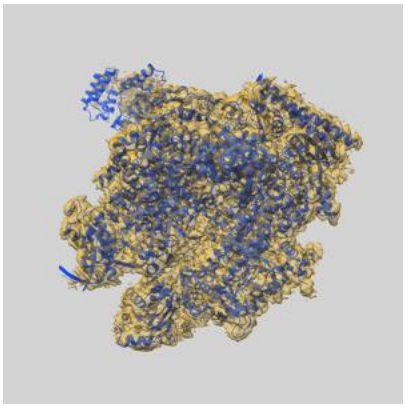
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-38624 and PDB model 8XSO. Per-residue inclusion information can be found in section 3 on page 8.

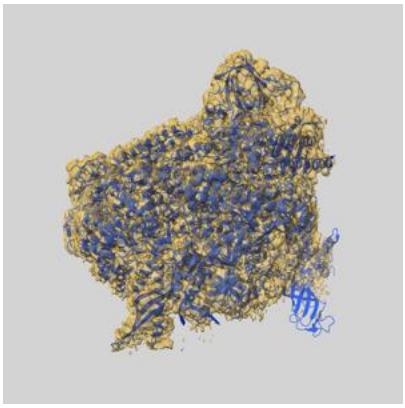
9.1 Map-model overlay



X



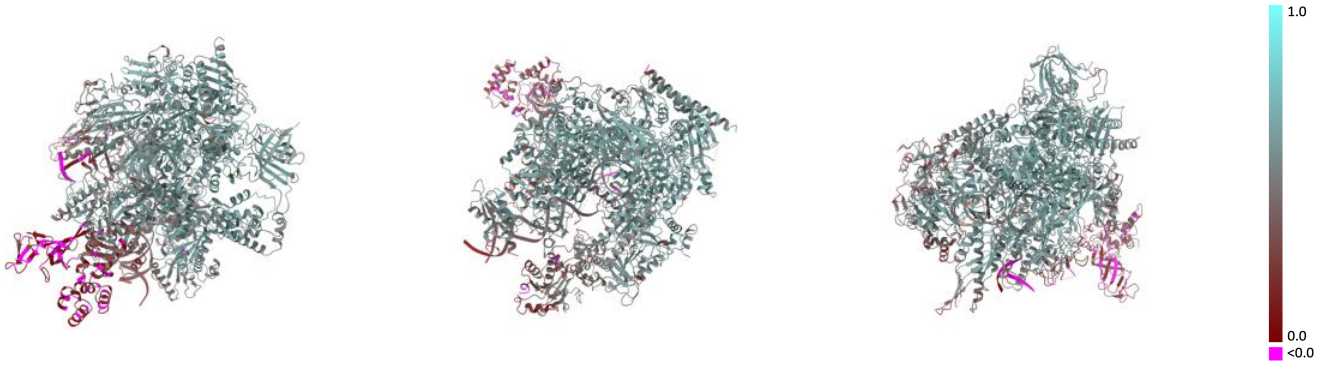
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.0077 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.

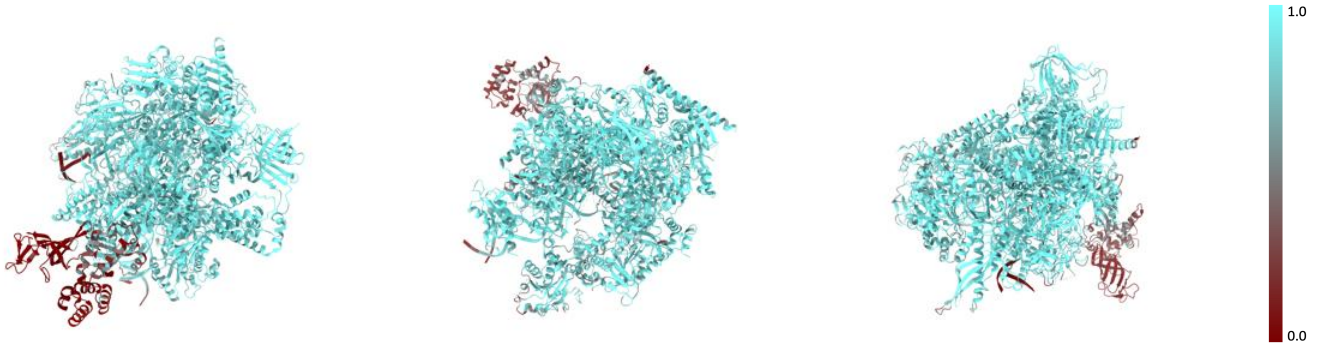
9.2 Q-score mapped to coordinate model (i)



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.

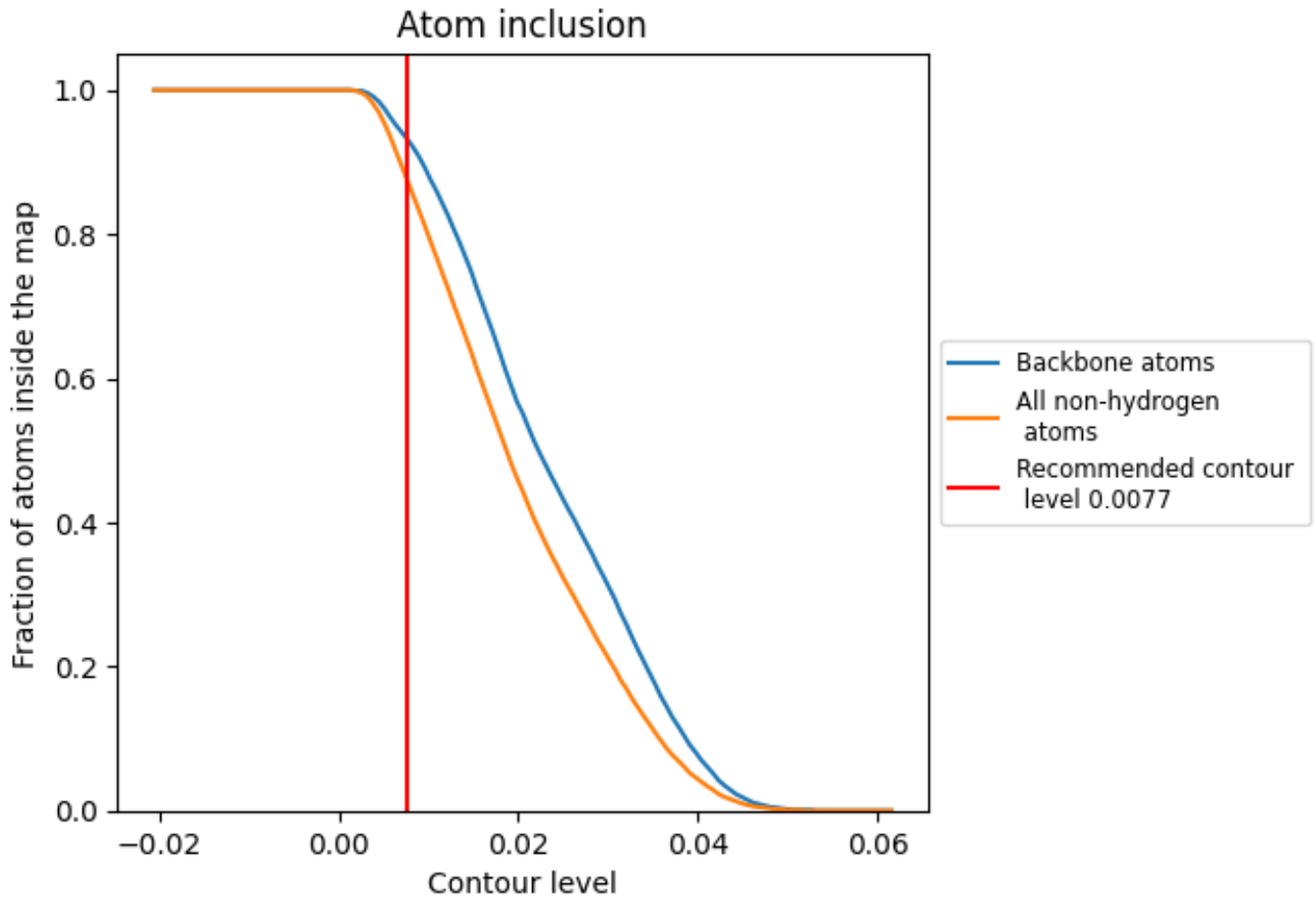
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.0077).

9.4 Atom inclusion (i)



At the recommended contour level, 93% of all backbone atoms, 87% 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 (0.0077) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8730	0.5050
A	0.9230	0.5330
B	0.9310	0.5410
C	0.9440	0.5700
D	0.1360	0.1320
E	0.9270	0.5280
F	0.9400	0.5630
G	0.3480	0.2330
H	0.9380	0.5570
I	0.8210	0.4220
J	0.9540	0.6060
K	0.9570	0.5780
L	0.8880	0.4710
N	0.7320	0.2670
P	0.9960	0.5610
T	0.8290	0.3770