Full wwPDB EM Validation Report ⓘ

Jun 27, 2024 – 02:36 AM JST

PDB ID	:	8HIL
EMDB ID	:	EMD-34820
Title	:	A cryo-EM structure of B. oleracea RNA polymerase V at 3.57 Angstrom
Authors	:	Du, X.; Xie, G.; Hu, H.; Du, J.
Deposited on	:	2022-11-20
Resolution	:	3.57 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:

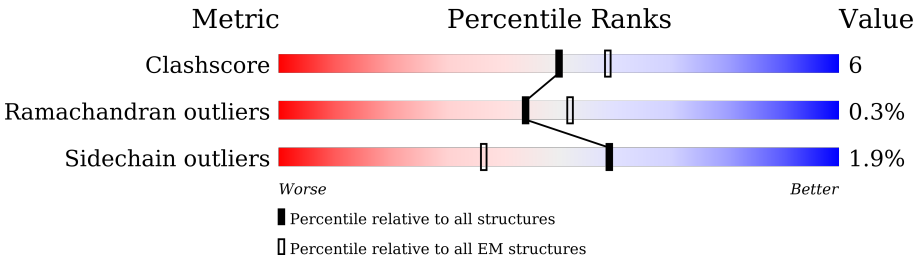
EMDB validation analysis	:	0.0.1.dev92
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

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 3.57 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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

Mol	Chain	Length	Quality of chain
1	A	2032	35% 7% 58%
2	B	1169	5% 75% 10% 14%
3	C	319	82% 12% 6%
4	E	230	10% 77% 13% 10%
5	F	144	48% 6% 45%
6	H	146	8% 73% 19% 5%
7	I	114	38% 75% 11% 13%
8	J	71	85% 6% 10%

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Mol	Chain	Length	Quality of chain
9	K	116	
10	L	51	

2 Entry composition (i)

There are 12 unique types of molecules in this entry. The entry contains 23134 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 V largest subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	860	6724	4243	1158	1278	45	0	0

- Molecule 2 is a protein called DNA-dependent RNA polymerase IV and V subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	1008	8002	5039	1415	1504	44	0	0

- Molecule 3 is a protein called RPOLD domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	300	2340	1463	393	471	13	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	3	THR	SER	variant	UNP A0A0D3D418

- Molecule 4 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	E	208	1698	1079	302	315	2	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	101	GLY	SER	variant	UNP A0A0D3DTU3
E	182	GLN	HIS	variant	UNP A0A0D3DTU3
E	210	ILE	VAL	variant	UNP A0A0D3DTU3

- Molecule 5 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC2.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	F	79	Total	C	N	O	S	0	0
			653	415	113	121	4		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	51	GLU	ASP	variant	UNP A0A0D3BZZ8

- Molecule 6 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC3.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	H	142	Total	C	N	O	S	0	0
			1135	732	184	210	9		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
7	I	99	Total	C	N	O	S	0	0
			799	488	152	147	12		

- Molecule 8 is a protein called DNA-directed RNA polymerases I, II, and III subunit RPABC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	J	64	Total	C	N	O	S	0	0
			514	328	86	93	7		

- Molecule 9 is a protein called RNA_pol_L_2 domain-containing protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	K	108	Total	C	N	O	S	0	0
			887	563	154	168	2		

- Molecule 10 is a protein called DNA-directed RNA polymerases II, IV and V subunit 12.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	L	46	Total	C	N	O	S	0	0
			375	229	71	71	4		

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
L	18	GLU	LYS	variant	UNP A0A0D2ZPP3
L	32	CYS	ARG	variant	UNP A0A0D2ZPP3

- Molecule 11 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
11	A	1	Total Zn 1 1	0
11	C	1	Total Zn 1 1	0
11	I	2	Total Zn 2 2	0
11	J	1	Total Zn 1 1	0
11	L	1	Total Zn 1 1	0

- Molecule 12 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

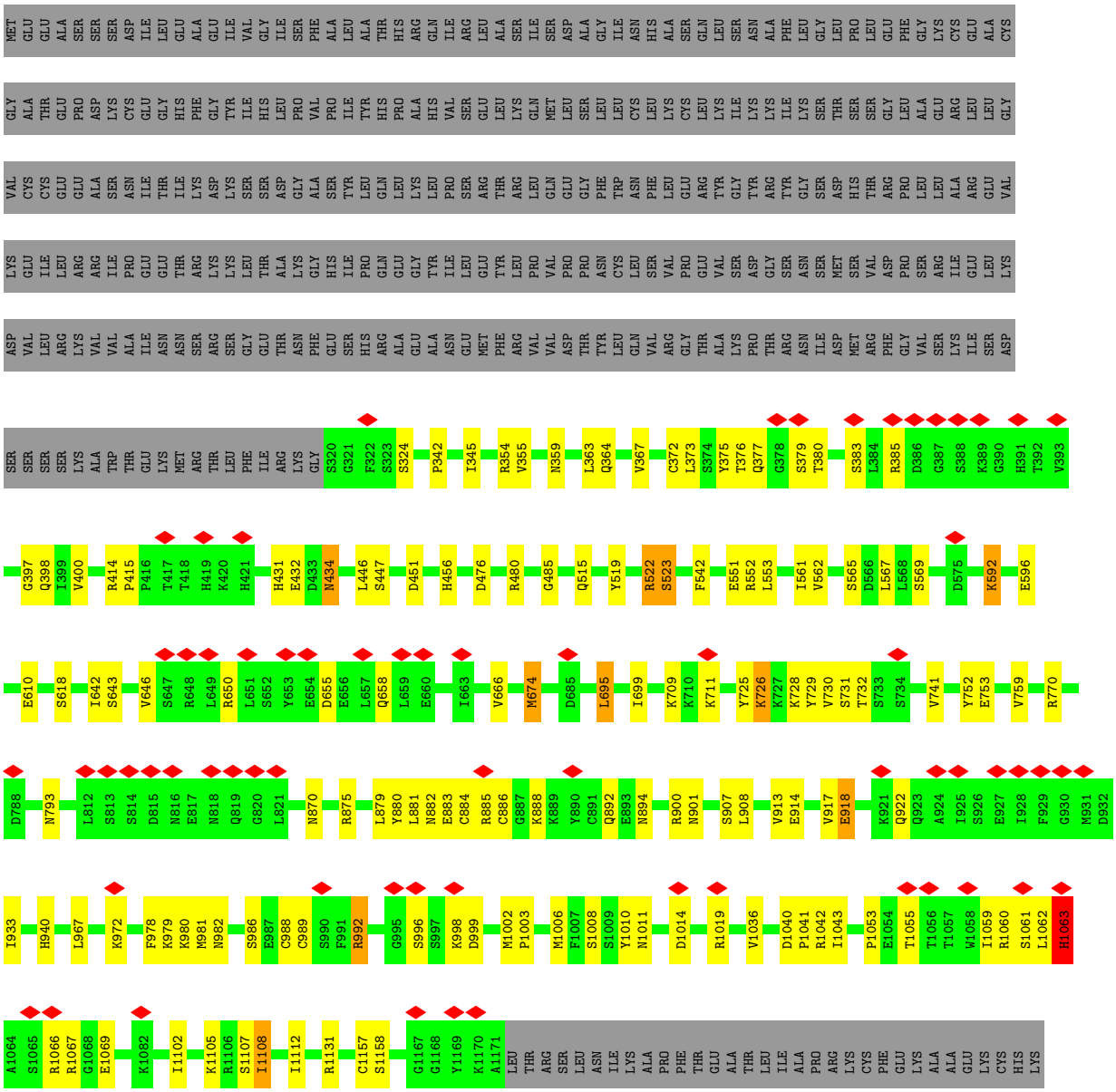
Mol	Chain	Residues	Atoms	AltConf
12	A	1	Total Mg 1 1	0

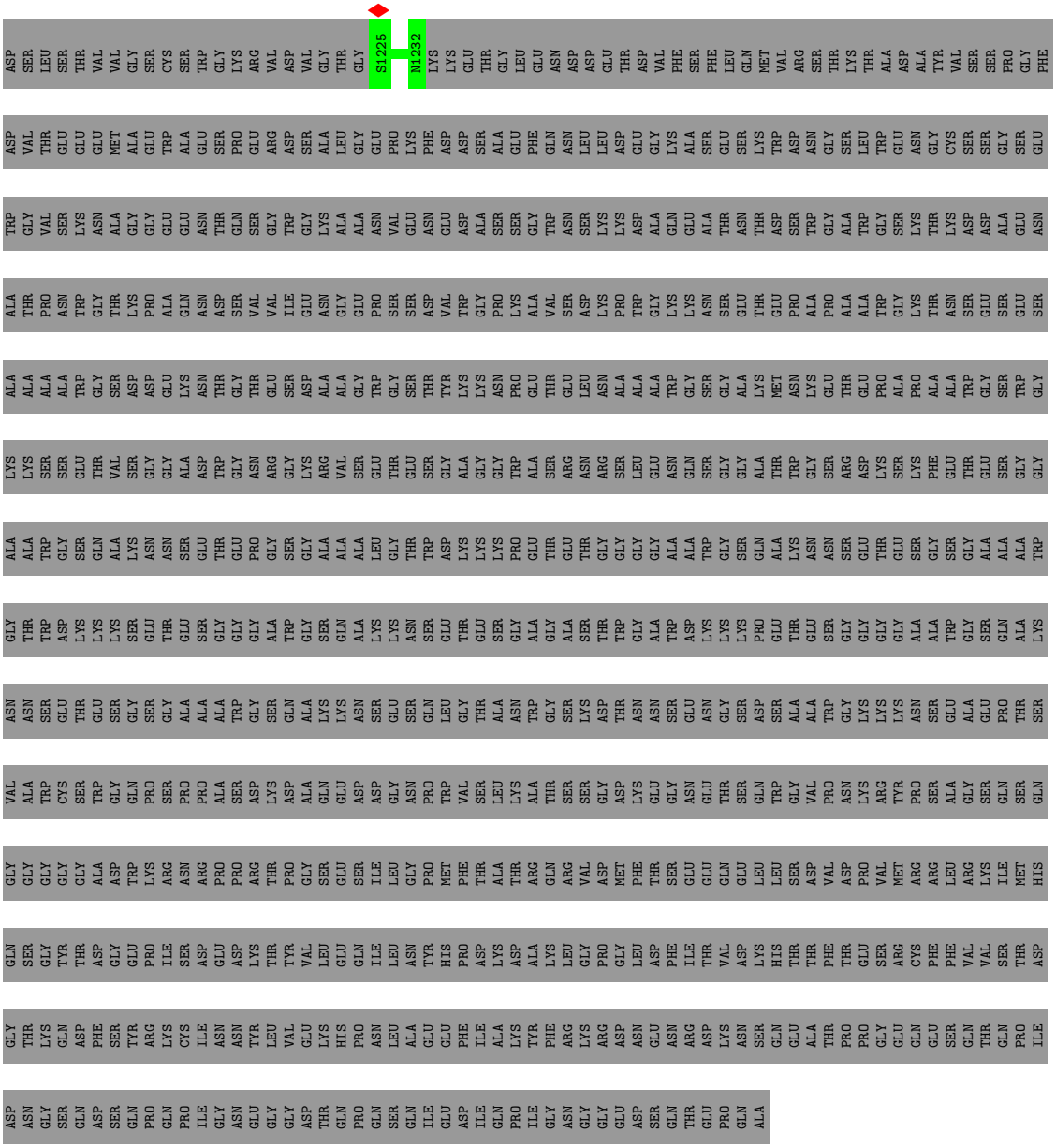
3 Residue-property plots (i)

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 V largest subunit

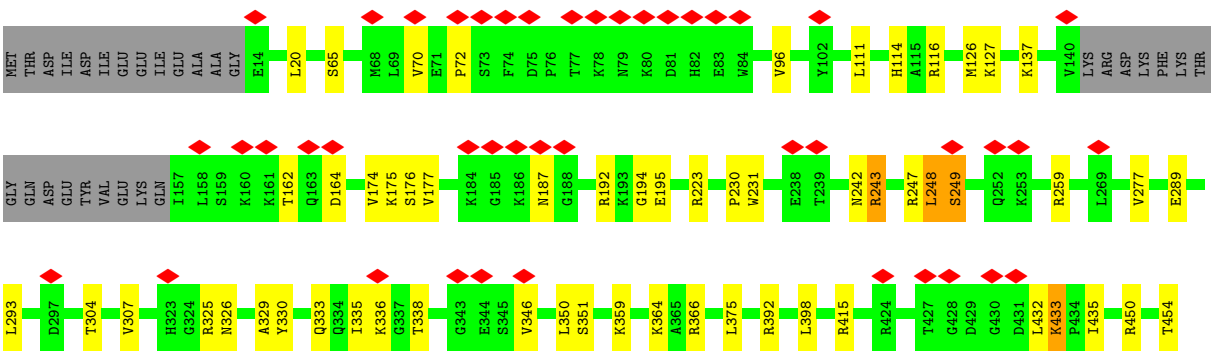
Chain A:

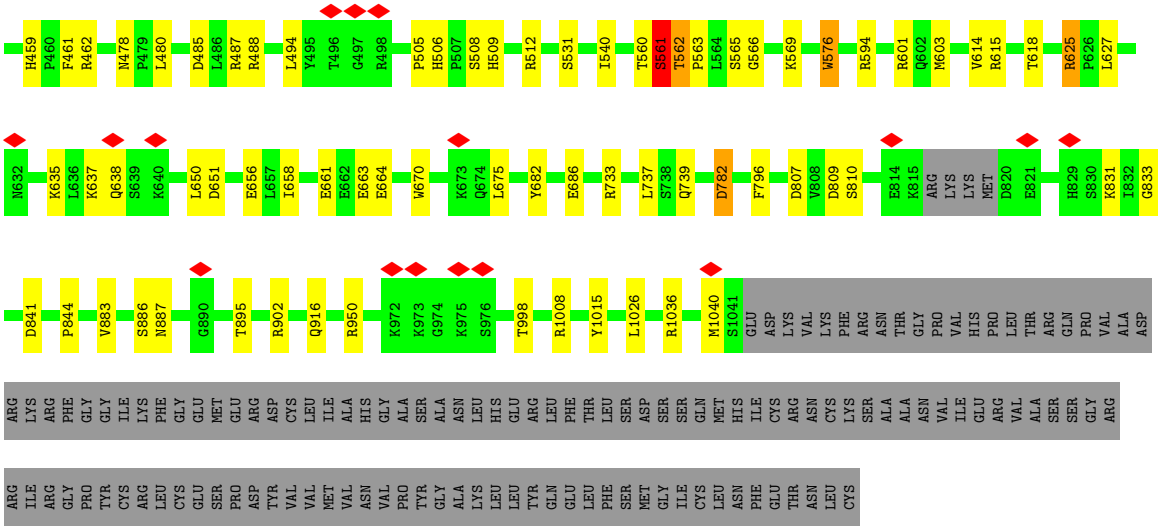




• Molecule 2: DNA-dependent RNA polymerase IV and V subunit 2

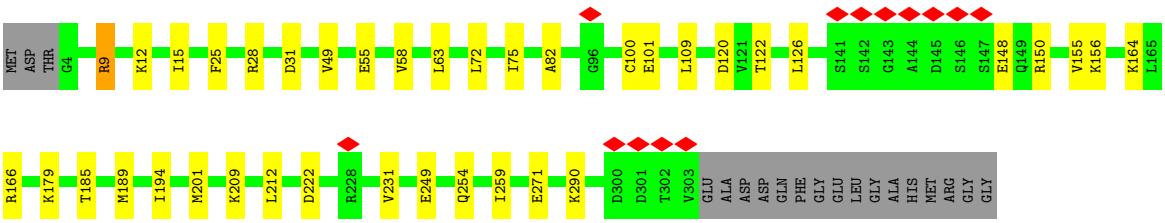
Chain B:





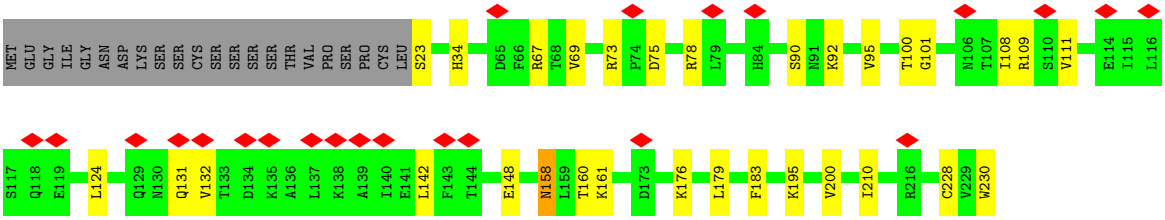
• Molecule 3: RPOLD domain-containing protein

Chain C:



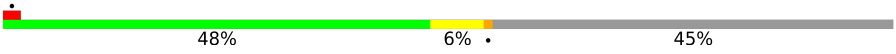
• Molecule 4: DNA-directed RNA polymerases I, II, and III subunit RPABC1

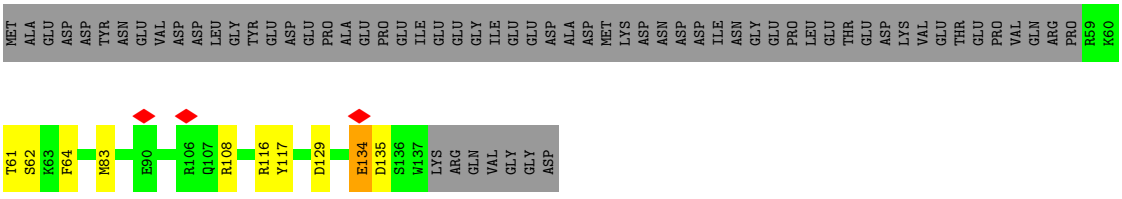
Chain E:



• Molecule 5: DNA-directed RNA polymerases I, II, and III subunit RPABC2

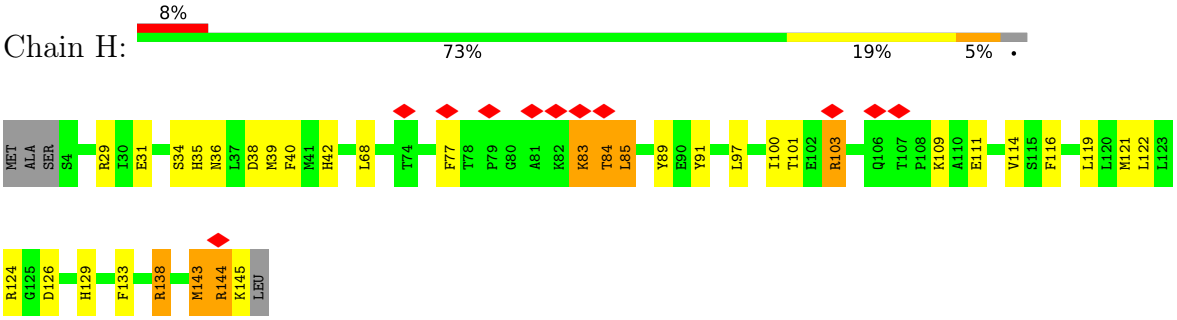
Chain F:





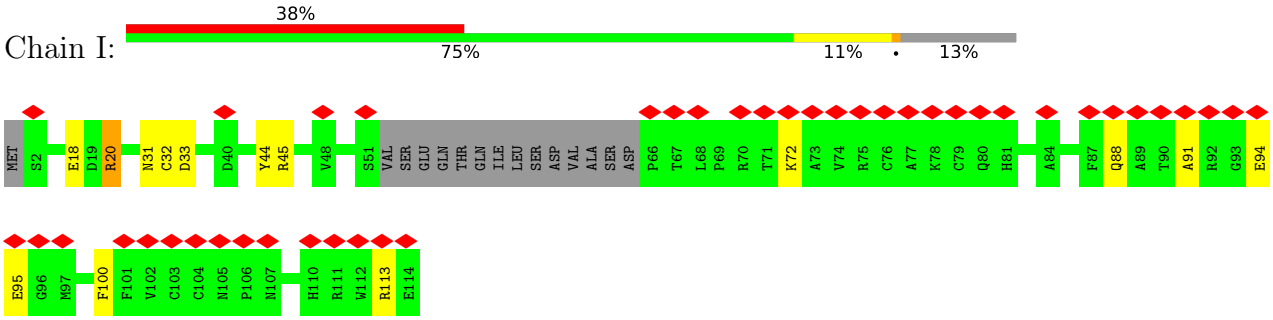
• Molecule 6: DNA-directed RNA polymerases I, II, and III subunit RPABC3

Chain H:



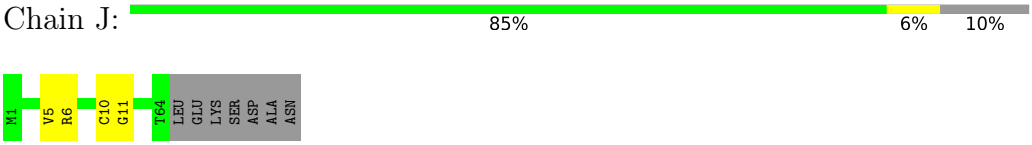
• Molecule 7: DNA-directed RNA polymerase subunit

Chain I:



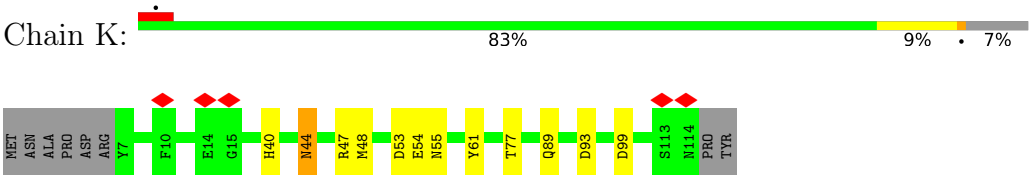
• Molecule 8: DNA-directed RNA polymerases I, II, and III subunit RPABC5

Chain J:



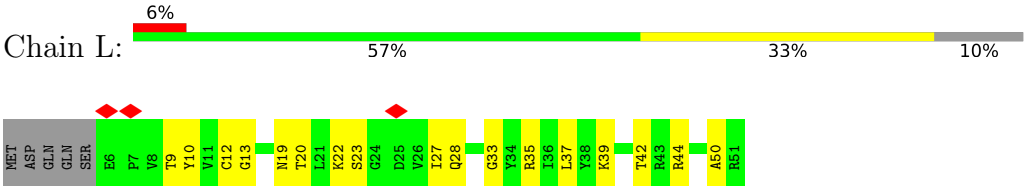
• Molecule 9: RNA_pol_L_2 domain-containing protein

Chain K:



• Molecule 10: DNA-directed RNA polymerases II, IV and V subunit 12

Chain L:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	63603	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	1.5625	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.111	Depositor
Minimum map value	-0.051	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.02	Depositor
Map size (Å)	328.5, 328.5, 328.5	wwPDB
Map dimensions	300, 300, 300	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.095, 1.095, 1.095	Depositor

5 Model quality

5.1 Standard geometry

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	0.36	0/6841	0.61	0/9235
2	B	0.41	1/8162 (0.0%)	0.63	0/11000
3	C	0.37	0/2371	0.60	0/3204
4	E	0.32	0/1724	0.57	0/2321
5	F	0.34	0/665	0.61	0/894
6	H	0.36	0/1161	0.71	0/1565
7	I	0.34	0/816	0.54	0/1097
8	J	0.43	0/522	0.61	0/706
9	K	0.38	0/905	0.57	0/1221
10	L	0.42	0/379	0.65	0/506
All	All	0.38	1/23546 (0.0%)	0.62	0/31749

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	B	902	ARG	C-N	-5.68	1.21	1.34

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	6724	0	6772	102	0
2	B	8002	0	7942	88	0
3	C	2340	0	2336	22	0
4	E	1698	0	1748	22	0
5	F	653	0	661	9	0
6	H	1135	0	1133	22	0
7	I	799	0	746	11	0
8	J	514	0	522	2	0
9	K	887	0	876	7	0
10	L	375	0	369	13	0
11	A	1	0	0	0	0
11	C	1	0	0	0	0
11	I	2	0	0	0	0
11	J	1	0	0	0	0
11	L	1	0	0	0	0
12	A	1	0	0	0	0
All	All	23134	0	23105	275	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

All (275) 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:884:CYS:SG	1:A:1066:ARG:NH2	2.26	1.07
1:A:759:VAL:HG12	2:B:505:PRO:HG2	1.48	0.92
1:A:726:LYS:HA	1:A:730:VAL:HG22	1.60	0.83
4:E:176:LYS:HG3	4:E:210:ILE:HD12	1.59	0.83
1:A:1014:ASP:HA	7:I:20:ARG:HH22	1.45	0.81
4:E:176:LYS:HG3	4:E:210:ILE:CD1	2.12	0.78
1:A:451:ASP:HB3	2:B:782:ASP:OD2	1.87	0.75
1:A:1060:ARG:HH21	1:A:1063:HIS:CE1	2.06	0.74
6:H:42:HIS:HB2	6:H:122:LEU:HB3	1.69	0.73
2:B:506:HIS:HD2	2:B:508:SER:H	1.35	0.73
1:A:885:ARG:HG3	1:A:888:LYS:HZ1	1.53	0.71
2:B:248:LEU:HB3	2:B:375:LEU:HD21	1.72	0.71
2:B:562:THR:H	2:B:563:PRO:HD3	1.57	0.70
2:B:506:HIS:H	2:B:509:HIS:CD2	2.12	0.68
2:B:1036:ARG:NH2	2:B:1040:MET:SD	2.68	0.67
1:A:884:CYS:O	1:A:885:ARG:HB2	1.94	0.67
1:A:725:TYR:O	1:A:730:VAL:HG13	1.94	0.67
6:H:85:LEU:H	6:H:85:LEU:HD12	1.60	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
10:L:27:ILE:HG23	10:L:37:LEU:HD12	1.78	0.66
2:B:111:LEU:HB2	2:B:114:HIS:HD2	1.61	0.66
2:B:506:HIS:H	2:B:509:HIS:HD2	1.43	0.65
3:C:194:ILE:HG12	3:C:259:ILE:HG12	1.79	0.65
6:H:39:MET:SD	6:H:129:HIS:NE2	2.70	0.64
2:B:670:TRP:HB2	2:B:675:LEU:HD22	1.78	0.64
2:B:561:SER:O	2:B:562:THR:HB	1.97	0.64
2:B:432:LEU:O	2:B:433:LYS:C	2.34	0.63
2:B:562:THR:H	2:B:563:PRO:CD	2.11	0.63
2:B:506:HIS:CD2	2:B:508:SER:H	2.16	0.63
1:A:354:ARG:NH1	5:F:83:MET:SD	2.72	0.62
2:B:65:SER:OG	2:B:415:ARG:NH2	2.33	0.62
2:B:487:ARG:NH2	2:B:531:SER:O	2.33	0.61
2:B:433:LYS:O	2:B:433:LYS:HG2	2.00	0.61
2:B:459:HIS:HD2	2:B:462:ARG:H	1.48	0.61
5:F:61:THR:O	5:F:116:ARG:NH1	2.33	0.61
1:A:431:HIS:ND1	1:A:432:GLU:O	2.33	0.61
1:A:1061:SER:OG	1:A:1108:ILE:HD11	2.01	0.60
1:A:1063:HIS:CE1	1:A:1067:ARG:HH22	2.18	0.60
2:B:259:ARG:NH2	7:I:44:TYR:OH	2.35	0.59
2:B:231:TRP:HD1	2:B:249:SER:CB	2.16	0.59
3:C:249:GLU:HG2	3:C:254:GLN:HE22	1.67	0.59
2:B:20:LEU:HD13	2:B:637:LYS:HB2	1.84	0.59
1:A:364:GLN:HA	1:A:367:VAL:HG12	1.85	0.59
1:A:982:ASN:HD21	1:A:1006:MET:HB2	1.67	0.59
1:A:1059:ILE:HG13	1:A:1131:ARG:HG2	1.85	0.59
2:B:335:ILE:HG22	2:B:336:LYS:HG3	1.84	0.59
3:C:100:CYS:SG	3:C:101:GLU:N	2.75	0.59
6:H:114:VAL:HG22	6:H:121:MET:HB3	1.85	0.59
2:B:351:SER:O	2:B:364:LYS:NZ	2.35	0.57
10:L:19:ASN:HD22	10:L:37:LEU:HD21	1.68	0.57
2:B:231:TRP:HD1	2:B:249:SER:HB3	1.70	0.57
1:A:642:ILE:HD11	1:A:666:VAL:HG21	1.87	0.56
1:A:992:ARG:NH1	1:A:998:LYS:O	2.38	0.56
5:F:108:ARG:NH1	5:F:129:ASP:O	2.39	0.56
2:B:231:TRP:CD1	2:B:249:SER:HB3	2.41	0.56
1:A:1036:VAL:HG11	1:A:1041:PRO:HG3	1.86	0.56
2:B:70:VAL:HG13	2:B:72:PRO:HD3	1.88	0.56
1:A:884:CYS:HA	1:A:892:GLN:HE22	1.70	0.56
1:A:988:CYS:SG	1:A:989:CYS:N	2.79	0.56
2:B:601:ARG:NH1	2:B:650:LEU:O	2.36	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:726:LYS:HA	1:A:730:VAL:CG2	2.35	0.56
1:A:376:THR:HG23	1:A:380:THR:HA	1.88	0.55
10:L:42:THR:OG1	10:L:44:ARG:NH1	2.38	0.55
1:A:372:CYS:SG	1:A:373:LEU:N	2.76	0.55
2:B:594:ARG:NH1	2:B:603:MET:O	2.39	0.55
2:B:1015:TYR:HE2	3:C:189:MET:HA	1.72	0.55
8:J:10:CYS:SG	8:J:11:GLY:N	2.80	0.55
3:C:290:LYS:NZ	9:K:99:ASP:OD1	2.33	0.55
2:B:366:ARG:NH2	2:B:560:THR:O	2.40	0.55
2:B:594:ARG:NH2	2:B:656:GLU:OE2	2.36	0.55
2:B:625:ARG:NH2	2:B:686:GLU:OE2	2.40	0.55
2:B:277:VAL:HG11	2:B:330:TYR:HD2	1.71	0.55
2:B:512:ARG:NH1	2:B:663:GLU:OE1	2.40	0.55
2:B:887:ASN:O	10:L:35:ARG:NH1	2.39	0.55
1:A:377:GLN:HG3	1:A:379:SER:H	1.71	0.54
6:H:116:PHE:HB2	6:H:119:LEU:HB2	1.88	0.54
2:B:478:ASN:HB3	2:B:480:LEU:H	1.72	0.54
2:B:883:VAL:HB	2:B:895:THR:HB	1.88	0.54
2:B:916:GLN:OE1	2:B:950:ARG:NH1	2.40	0.54
2:B:506:HIS:N	2:B:509:HIS:HD2	2.06	0.53
1:A:884:CYS:HG	1:A:1066:ARG:HH21	1.54	0.53
6:H:109:LYS:HB3	6:H:126:ASP:H	1.73	0.53
1:A:882:ASN:OD1	1:A:1066:ARG:NH1	2.41	0.53
1:A:342:PRO:HB3	1:A:434:ASN:HA	1.91	0.53
7:I:94:GLU:CG	7:I:100:PHE:HZ	2.22	0.53
4:E:131:GLN:NE2	4:E:132:VAL:O	2.42	0.53
6:H:40:PHE:HB3	6:H:124:ARG:HB3	1.91	0.53
2:B:844:PRO:O	10:L:39:LYS:NZ	2.39	0.53
2:B:831:LYS:NZ	2:B:833:GLY:O	2.34	0.53
6:H:77:PHE:O	6:H:83:LYS:NZ	2.41	0.52
1:A:917:VAL:HG22	7:I:44:TYR:HB3	1.91	0.52
4:E:109:ARG:HH22	4:E:142:LEU:HD21	1.74	0.52
1:A:451:ASP:HB3	2:B:782:ASP:CG	2.30	0.52
9:K:47:ARG:NH1	9:K:48:MET:SD	2.83	0.52
1:A:728:LYS:NZ	2:B:682:TYR:OH	2.43	0.52
5:F:62:SER:OG	5:F:116:ARG:NH1	2.42	0.52
1:A:725:TYR:CE2	1:A:729:TYR:HB3	2.45	0.51
6:H:89:TYR:CD1	6:H:144:ARG:HG2	2.46	0.51
1:A:885:ARG:CZ	1:A:888:LYS:HE3	2.40	0.51
2:B:485:ASP:OD1	2:B:488:ARG:NH2	2.43	0.51
1:A:646:VAL:O	1:A:650:ARG:NH1	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:H:111:GLU:OE2	6:H:124:ARG:NH1	2.43	0.51
7:I:32:CYS:SG	7:I:33:ASP:N	2.83	0.51
6:H:34:SER:HB3	6:H:39:MET:H	1.76	0.51
1:A:996:SER:HB2	7:I:45:ARG:HH22	1.76	0.51
1:A:542:PHE:HB3	1:A:567:LEU:HD23	1.91	0.51
2:B:96:VAL:HG22	2:B:126:MET:HG2	1.91	0.51
4:E:69:VAL:O	4:E:78:ARG:NH2	2.44	0.51
2:B:230:PRO:HB2	2:B:247:ARG:HD2	1.93	0.50
2:B:601:ARG:NH2	2:B:651:ASP:OD1	2.44	0.50
1:A:522:ARG:O	1:A:523:SER:C	2.50	0.50
2:B:243:ARG:O	2:B:243:ARG:NH1	2.43	0.50
1:A:883:GLU:O	4:E:23:SER:OG	2.29	0.50
2:B:242:ASN:N	2:B:242:ASN:OD1	2.45	0.50
2:B:176:SER:OG	2:B:177:VAL:N	2.44	0.50
3:C:179:LYS:NZ	10:L:50:ALA:O	2.37	0.50
1:A:354:ARG:O	1:A:359:ASN:ND2	2.43	0.50
1:A:1112:ILE:HD12	1:A:1131:ARG:HD2	1.92	0.50
1:A:522:ARG:HH11	1:A:551:GLU:HB2	1.75	0.49
3:C:201:MET:O	3:C:209:LYS:NZ	2.41	0.49
1:A:980:LYS:HG3	1:A:1008:SER:HB3	1.94	0.49
4:E:95:VAL:HG12	4:E:124:LEU:HB2	1.94	0.49
1:A:986:SER:HA	1:A:1002:MET:HA	1.94	0.49
2:B:325:ARG:O	2:B:329:ALA:CB	2.60	0.49
1:A:372:CYS:HB3	1:A:385:ARG:HG3	1.94	0.49
1:A:1157:CYS:SG	1:A:1158:SER:N	2.85	0.49
2:B:111:LEU:HB2	2:B:114:HIS:CD2	2.46	0.49
2:B:366:ARG:HB3	2:B:576:TRP:HZ3	1.78	0.49
1:A:913:VAL:HG23	1:A:914:GLU:HG2	1.95	0.49
6:H:100:ILE:O	6:H:103:ARG:NH2	2.46	0.49
1:A:879:LEU:HB3	1:A:1102:ILE:HD11	1.93	0.49
2:B:231:TRP:HB2	2:B:249:SER:HB3	1.95	0.49
2:B:230:PRO:HA	2:B:249:SER:OG	2.13	0.48
4:E:75:ASP:OD1	4:E:75:ASP:N	2.45	0.48
1:A:793:ASN:ND2	5:F:117:TYR:O	2.46	0.48
4:E:158:ASN:ND2	4:E:160:THR:OG1	2.46	0.48
6:H:68:LEU:HD11	6:H:84:THR:HG22	1.95	0.48
4:E:90:SER:OG	4:E:92:LYS:NZ	2.46	0.48
3:C:63:LEU:HD12	3:C:155:VAL:HG13	1.95	0.48
3:C:222:ASP:HB3	3:C:231:VAL:HG13	1.96	0.48
5:F:134:GLU:O	5:F:135:ASP:HB2	2.13	0.48
1:A:888:LYS:HZ1	4:E:23:SER:HB3	1.79	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:H:97:LEU:HG	6:H:114:VAL:HG12	1.95	0.48
2:B:325:ARG:O	2:B:329:ALA:HB2	2.14	0.48
2:B:807:ASP:N	2:B:807:ASP:OD1	2.46	0.48
6:H:133:PHE:HB2	6:H:138:ARG:HH12	1.79	0.48
1:A:709:LYS:HA	1:A:711:LYS:HE2	1.95	0.48
2:B:560:THR:OG1	2:B:561:SER:N	2.46	0.48
2:B:886:SER:HB3	10:L:27:ILE:HB	1.96	0.47
1:A:907:SER:OG	1:A:908:LEU:N	2.47	0.47
1:A:1062:LEU:HD22	1:A:1063:HIS:H	1.77	0.47
2:B:560:THR:O	2:B:562:THR:N	2.47	0.47
3:C:109:LEU:HB2	3:C:126:LEU:HD23	1.95	0.47
2:B:392:ARG:NH1	2:B:664:GLU:OE2	2.47	0.47
1:A:377:GLN:OE1	1:A:398:GLN:NE2	2.47	0.47
1:A:885:ARG:O	1:A:886:CYS:HB2	2.15	0.47
1:A:999:ASP:OD1	1:A:999:ASP:N	2.48	0.47
1:A:933:ILE:HD13	1:A:1010:TYR:HB3	1.97	0.47
2:B:194:GLY:N	2:B:195:GLU:OE1	2.47	0.47
2:B:289:GLU:O	2:B:293:LEU:N	2.46	0.47
2:B:304:THR:HA	2:B:307:VAL:HG12	1.95	0.47
4:E:108:ILE:HD12	4:E:109:ARG:HE	1.79	0.47
6:H:31:GLU:HA	6:H:42:HIS:HD2	1.80	0.47
6:H:34:SER:OG	6:H:35:HIS:N	2.48	0.47
1:A:978:PHE:H	1:A:1011:ASN:HD21	1.61	0.47
8:J:5:VAL:HG12	8:J:6:ARG:HG2	1.97	0.47
2:B:565:SER:OG	2:B:566:GLY:N	2.48	0.47
1:A:1053:PRO:HG3	1:A:1069:GLU:HG2	1.97	0.46
3:C:58:VAL:HG12	3:C:164:LYS:HB2	1.97	0.46
1:A:363:LEU:HD21	1:A:400:VAL:HG21	1.97	0.46
4:E:179:LEU:HD23	4:E:210:ILE:HD13	1.97	0.46
2:B:737:LEU:HD11	2:B:739:GLN:HE21	1.79	0.46
5:F:64:PHE:O	5:F:116:ARG:NH2	2.44	0.46
6:H:144:ARG:HA	6:H:144:ARG:HD2	1.49	0.46
2:B:561:SER:O	2:B:562:THR:CB	2.61	0.46
9:K:55:ASN:O	9:K:77:THR:OG1	2.29	0.46
1:A:324:SER:HB2	1:A:456:HIS:HA	1.97	0.46
7:I:91:ALA:HB3	7:I:94:GLU:OE2	2.16	0.46
6:H:101:THR:HB	6:H:111:GLU:HB2	1.97	0.46
7:I:18:GLU:OE2	7:I:20:ARG:HG3	2.16	0.46
4:E:176:LYS:CG	4:E:210:ILE:HD12	2.40	0.45
1:A:363:LEU:HD11	1:A:400:VAL:HG11	1.97	0.45
1:A:355:VAL:O	1:A:397:GLY:N	2.46	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1105:LYS:HE3	4:E:161:LYS:HB3	1.98	0.45
2:B:127:LYS:HD2	2:B:164:ASP:HB3	1.99	0.45
1:A:561:ILE:HD13	1:A:569:SER:HB3	1.99	0.45
1:A:918:GLU:OE2	1:A:922:GLN:NE2	2.41	0.45
1:A:728:LYS:O	1:A:732:THR:OG1	2.27	0.45
1:A:880:TYR:H	1:A:1107:SER:HG	1.57	0.45
1:A:1060:ARG:NH2	1:A:1063:HIS:CE1	2.80	0.45
2:B:398:LEU:HD23	2:B:398:LEU:HA	1.84	0.45
2:B:627:LEU:HD12	2:B:658:ILE:HD12	1.99	0.45
2:B:841:ASP:OD2	10:L:10:TYR:OH	2.30	0.45
7:I:94:GLU:HG2	7:I:100:PHE:CZ	2.52	0.45
1:A:342:PRO:HG2	1:A:345:ILE:HG22	1.99	0.44
1:A:1055:THR:HA	1:A:1060:ARG:HH22	1.83	0.44
2:B:162:THR:HG22	2:B:435:ILE:HG12	1.99	0.44
1:A:881:LEU:HB3	1:A:1102:ILE:HD12	1.99	0.44
1:A:515:GLN:NE2	9:K:61:TYR:O	2.50	0.44
1:A:519:TYR:CZ	1:A:610:GLU:HG3	2.53	0.44
2:B:223:ARG:NH2	2:B:661:GLU:OE2	2.48	0.44
3:C:148:GLU:HG3	3:C:150:ARG:H	1.81	0.44
5:F:134:GLU:H	5:F:134:GLU:HG2	1.52	0.44
9:K:89:GLN:NE2	9:K:93:ASP:OD2	2.41	0.44
1:A:1063:HIS:CE1	1:A:1067:ARG:NH2	2.86	0.44
1:A:741:VAL:HG22	1:A:753:GLU:HB2	1.99	0.44
9:K:40:HIS:O	9:K:44:ASN:HB2	2.18	0.44
2:B:231:TRP:HB3	2:B:248:LEU:HD23	2.00	0.43
3:C:122:THR:HG21	3:C:150:ARG:HG2	2.00	0.43
1:A:729:TYR:HE2	1:A:752:TYR:CD2	2.36	0.43
2:B:333:GLN:O	2:B:338:THR:OG1	2.24	0.43
2:B:450:ARG:O	2:B:454:THR:OG1	2.33	0.43
2:B:540:ILE:HB	2:B:618:THR:HB	2.01	0.43
3:C:9:ARG:HH12	3:C:31:ASP:HB2	1.83	0.43
1:A:618:SER:OG	2:B:1026:LEU:O	2.35	0.43
1:A:940:HIS:HA	1:A:1003:PRO:HA	2.01	0.43
6:H:85:LEU:HD12	6:H:85:LEU:N	2.27	0.43
1:A:552:ARG:N	1:A:565:SER:OG	2.51	0.43
4:E:100:THR:OG1	4:E:101:GLY:N	2.51	0.43
2:B:459:HIS:CD2	2:B:461:PHE:H	2.37	0.43
10:L:22:LYS:HG3	10:L:23:SER:H	1.83	0.43
3:C:185:THR:HB	3:C:271:GLU:HB2	2.01	0.43
1:A:967:LEU:HD12	1:A:972:LYS:HZ1	1.84	0.43
2:B:116:ARG:HH11	2:B:733:ARG:HH11	1.66	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
4:E:195:LYS:HA	4:E:200:VAL:HG11	2.01	0.43
1:A:553:LEU:HD23	1:A:562:VAL:HG11	2.01	0.43
1:A:998:LYS:HG3	1:A:999:ASP:H	1.84	0.43
10:L:12:CYS:SG	10:L:13:GLY:N	2.92	0.43
3:C:55:GLU:OE1	3:C:166:ARG:NH1	2.49	0.43
9:K:53:ASP:OD1	9:K:54:GLU:N	2.52	0.43
1:A:729:TYR:HE2	1:A:752:TYR:HB3	1.82	0.42
1:A:992:ARG:HG2	1:A:996:SER:HB3	2.00	0.42
2:B:346:VAL:HG12	2:B:350:LEU:HD11	2.00	0.42
2:B:998:THR:HB	2:B:1008:ARG:HG3	2.01	0.42
2:B:249:SER:OG	2:B:249:SER:O	2.32	0.42
4:E:124:LEU:HD22	4:E:148:GLU:HB2	2.00	0.42
1:A:643:SER:HA	1:A:646:VAL:HG12	2.01	0.42
2:B:625:ARG:NH2	2:B:663:GLU:OE2	2.49	0.42
7:I:94:GLU:OE1	7:I:113:ARG:NH2	2.53	0.42
10:L:9:THR:HG23	10:L:20:THR:HG22	2.01	0.42
10:L:37:LEU:HD23	10:L:37:LEU:HA	1.88	0.42
1:A:728:LYS:HA	1:A:731:SER:HB3	2.02	0.42
4:E:176:LYS:HG3	4:E:210:ILE:HD11	1.94	0.42
1:A:375:TYR:HE1	1:A:383:SER:HB2	1.85	0.42
1:A:729:TYR:HE2	1:A:752:TYR:CB	2.33	0.42
1:A:901:ASN:HD21	7:I:88:GLN:HE21	1.68	0.41
2:B:569:LYS:O	2:B:614:VAL:N	2.48	0.41
1:A:1040:ASP:HB3	1:A:1043:ILE:HG12	2.02	0.41
6:H:29:ARG:HD2	6:H:42:HIS:HB3	2.03	0.41
1:A:414:ARG:NH2	1:A:447:SER:OG	2.41	0.41
1:A:870:ASN:O	1:A:875:ARG:NH2	2.54	0.41
3:C:72:LEU:HD23	3:C:75:ILE:HD12	2.02	0.41
1:A:982:ASN:ND2	1:A:1006:MET:O	2.53	0.41
4:E:34:HIS:HB2	4:E:67:ARG:HH21	1.86	0.41
1:A:979:LYS:HG3	1:A:981:MET:HG2	2.03	0.41
2:B:796:PHE:O	2:B:1036:ARG:NH1	2.54	0.41
4:E:228:CYS:HG	4:E:230:TRP:HE1	1.66	0.41
10:L:28:GLN:HE21	10:L:33:GLY:HA2	1.85	0.41
1:A:415:PRO:HD3	1:A:456:HIS:CD2	2.56	0.41
1:A:674:MET:SD	1:A:695:LEU:HD22	2.61	0.41
1:A:674:MET:HG2	1:A:699:ILE:HG21	2.03	0.41
3:C:15:ILE:HG12	3:C:25:PHE:HB3	2.03	0.41
4:E:108:ILE:HA	4:E:111:VAL:HG22	2.03	0.40
3:C:120:ASP:HB3	3:C:156:LYS:HG2	2.03	0.40
6:H:91:TYR:HB3	6:H:143:MET:HG2	2.01	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:476:ASP:OD1	1:A:476:ASP:N	2.51	0.40
1:A:592:LYS:HB3	1:A:596:GLU:HG3	2.04	0.40
2:B:635:LYS:HA	2:B:638:GLN:HG2	2.03	0.40
3:C:120:ASP:HA	3:C:156:LYS:HA	2.02	0.40
5:F:134:GLU:O	5:F:135:ASP:CB	2.68	0.40
1:A:414:ARG:NH1	1:A:446:LEU:O	2.38	0.40
1:A:655:ASP:HB2	1:A:658:GLN:HB3	2.03	0.40
2:B:174:VAL:HG12	2:B:175:LYS:HG2	2.03	0.40
3:C:49:VAL:HG23	3:C:82:ALA:HB2	2.03	0.40
1:A:480:ARG:NH1	1:A:485:GLY:O	2.55	0.40
3:C:12:LYS:HB2	3:C:28:ARG:HG2	2.03	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	856/2032 (42%)	741 (87%)	112 (13%)	3 (0%)	34	71
2	B	1002/1169 (86%)	856 (85%)	141 (14%)	5 (0%)	29	67
3	C	298/319 (93%)	269 (90%)	29 (10%)	0	100	100
4	E	206/230 (90%)	186 (90%)	20 (10%)	0	100	100
5	F	77/144 (54%)	65 (84%)	12 (16%)	0	100	100
6	H	140/146 (96%)	112 (80%)	27 (19%)	1 (1%)	22	62
7	I	95/114 (83%)	78 (82%)	17 (18%)	0	100	100
8	J	62/71 (87%)	56 (90%)	6 (10%)	0	100	100
9	K	106/116 (91%)	98 (92%)	8 (8%)	0	100	100
10	L	44/51 (86%)	32 (73%)	12 (27%)	0	100	100
All	All	2886/4392 (66%)	2493 (86%)	384 (13%)	9 (0%)	44	74

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	523	SER
2	B	192	ARG
2	B	562	THR
2	B	810	SER
1	A	1063	HIS
2	B	561	SER
2	B	809	ASP
6	H	38	ASP
1	A	434	ASN

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	762/1709 (45%)	748 (98%)	14 (2%)	59 81
2	B	886/1026 (86%)	872 (98%)	14 (2%)	62 83
3	C	263/276 (95%)	261 (99%)	2 (1%)	81 92
4	E	189/209 (90%)	186 (98%)	3 (2%)	62 83
5	F	71/128 (56%)	70 (99%)	1 (1%)	67 85
6	H	124/127 (98%)	115 (93%)	9 (7%)	14 46
7	I	87/101 (86%)	83 (95%)	4 (5%)	27 61
8	J	57/63 (90%)	57 (100%)	0	100 100
9	K	98/105 (93%)	97 (99%)	1 (1%)	76 89
10	L	41/46 (89%)	41 (100%)	0	100 100
All	All	2578/3790 (68%)	2530 (98%)	48 (2%)	59 80

All (48) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	522	ARG
1	A	592	LYS
1	A	674	MET

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Mol	Chain	Res	Type
1	A	695	LEU
1	A	726	LYS
1	A	770	ARG
1	A	894	ASN
1	A	900	ARG
1	A	918	GLU
1	A	992	ARG
1	A	1019	ARG
1	A	1042	ARG
1	A	1063	HIS
1	A	1108	ILE
2	B	137	LYS
2	B	187	ASN
2	B	243	ARG
2	B	248	LEU
2	B	249	SER
2	B	326	ASN
2	B	359	LYS
2	B	433	LYS
2	B	494	LEU
2	B	561	SER
2	B	576	TRP
2	B	615	ARG
2	B	625	ARG
2	B	782	ASP
3	C	9	ARG
3	C	212	LEU
4	E	73	ARG
4	E	158	ASN
4	E	183	PHE
5	F	134	GLU
6	H	36	ASN
6	H	83	LYS
6	H	84	THR
6	H	85	LEU
6	H	103	ARG
6	H	138	ARG
6	H	143	MET
6	H	144	ARG
6	H	145	LYS
7	I	20	ARG
7	I	31	ASN

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Mol	Chain	Res	Type
7	I	72	LYS
7	I	95	GLU
9	K	44	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (36) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	335	ASN
1	A	456	HIS
1	A	635	HIS
1	A	705	GLN
1	A	892	GLN
1	A	894	ASN
1	A	901	ASN
1	A	923	GLN
1	A	1011	ASN
1	A	1063	HIS
2	B	114	HIS
2	B	163	GLN
2	B	187	ASN
2	B	216	GLN
2	B	437	HIS
2	B	446	ASN
2	B	459	HIS
2	B	506	HIS
2	B	509	HIS
2	B	714	GLN
2	B	718	HIS
2	B	764	ASN
2	B	985	HIS
3	C	254	GLN
3	C	280	GLN
4	E	158	ASN
6	H	35	HIS
6	H	36	ASN
6	H	42	HIS
7	I	31	ASN
7	I	41	ASN
7	I	49	HIS
7	I	81	HIS
9	K	44	ASN
9	K	51	HIS

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
9	K	65	HIS

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 monosaccharides in this entry.

5.6 Ligand geometry

Of 7 ligands modelled in this entry, 7 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

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

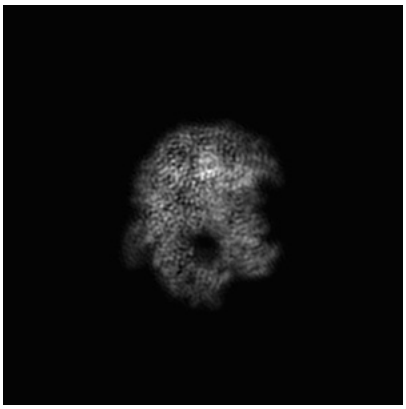
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-34820. These allow visual inspection of the internal detail of the map and identification of artifacts.

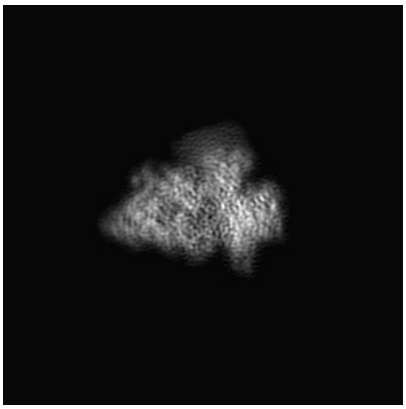
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

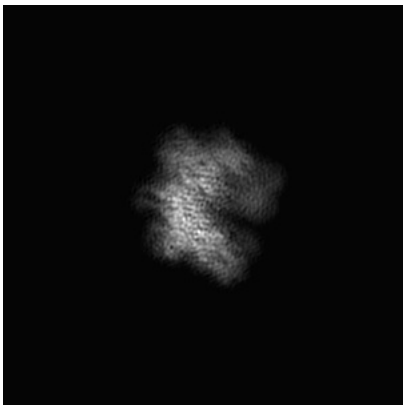
6.1.1 Primary map



X

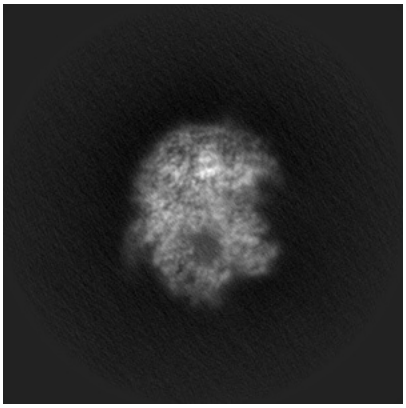


Y

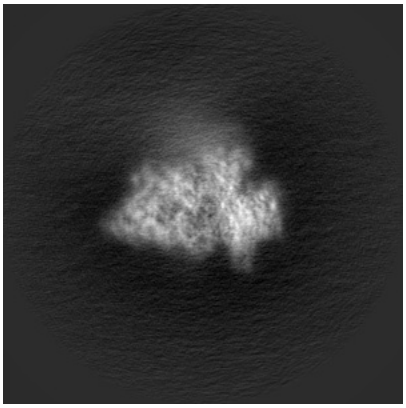


Z

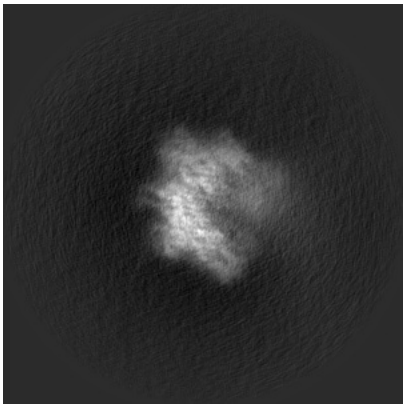
6.1.2 Raw map



X



Y



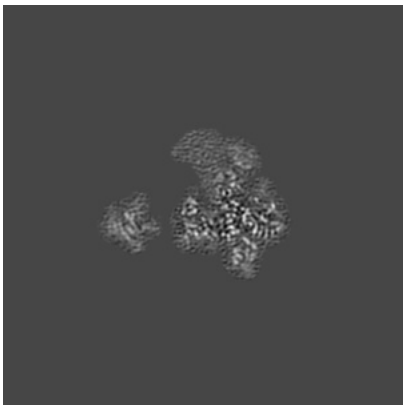
Z

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

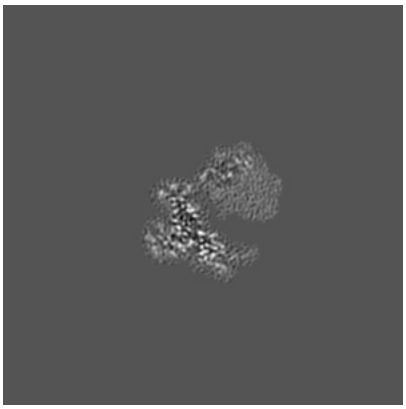
6.2 Central slices (i)

6.2.1 Primary map

X Index: 150

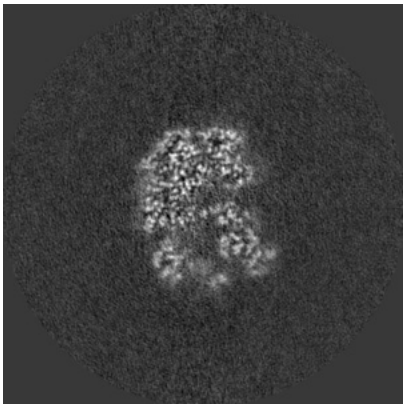


Y Index: 150

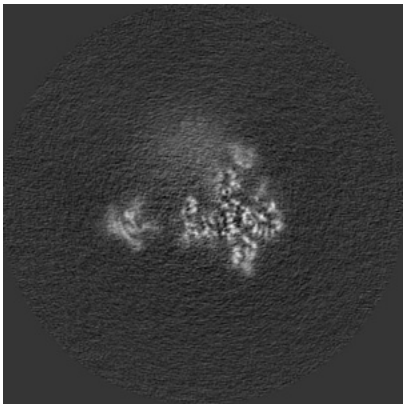


Z Index: 150

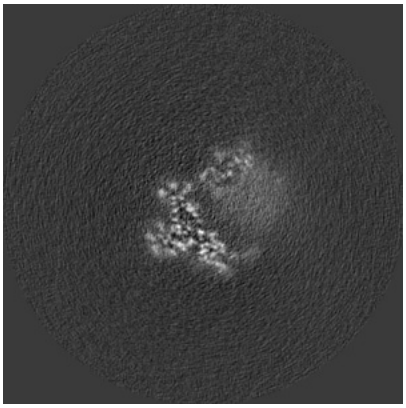
6.2.2 Raw map



X Index: 150



Y Index: 150

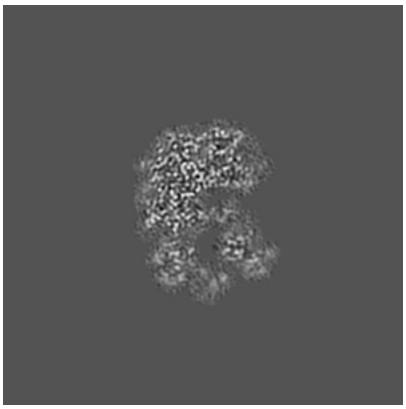


Z Index: 150

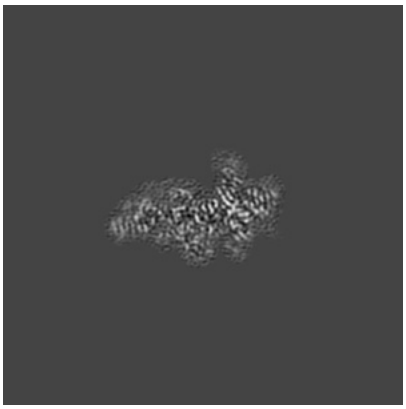
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

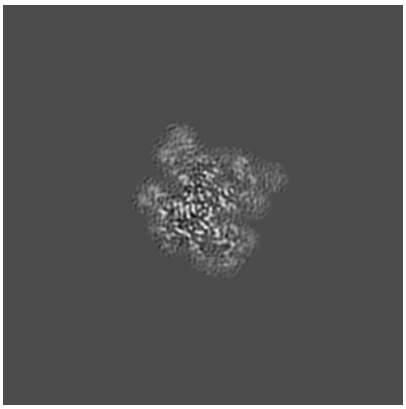
6.3.1 Primary map



X Index: 147

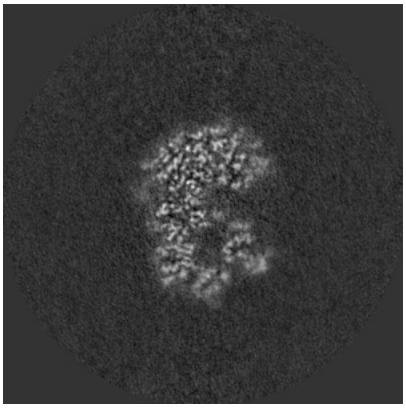


Y Index: 129

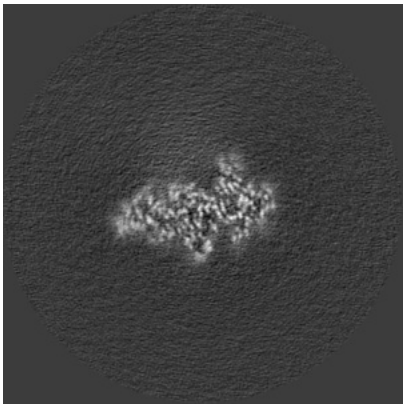


Z Index: 172

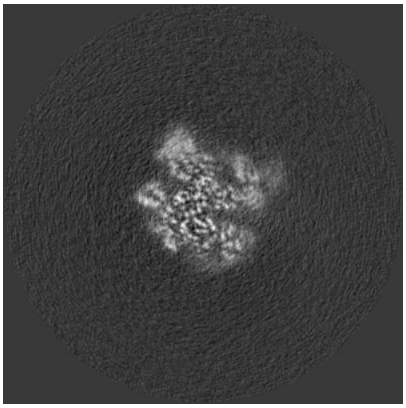
6.3.2 Raw map



X Index: 143



Y Index: 126

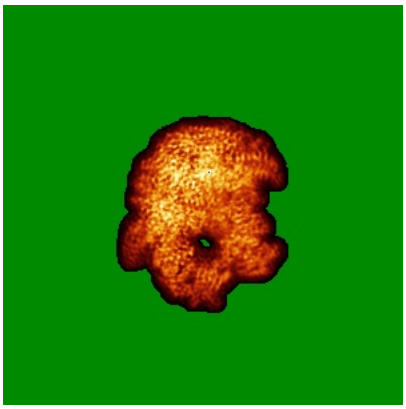


Z Index: 174

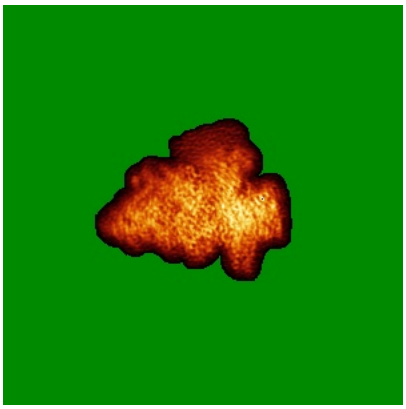
The images above show the largest variance slices of the map in three orthogonal directions.

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

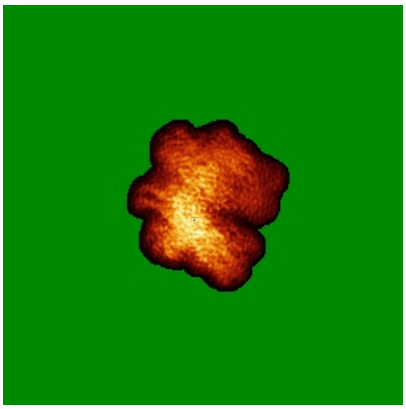
6.4.1 Primary map



X

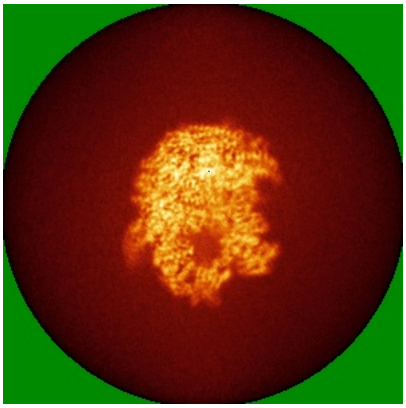


Y

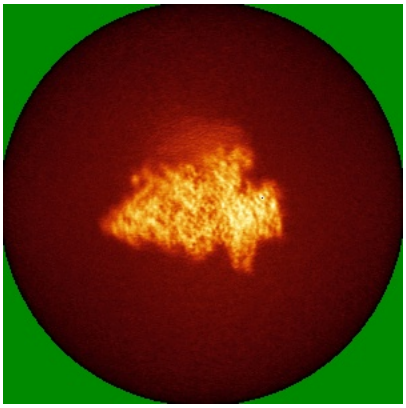


Z

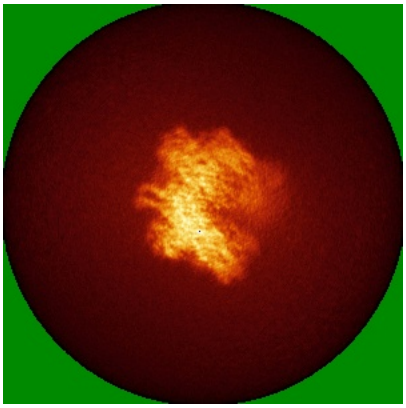
6.4.2 Raw map



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 0.02. 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.

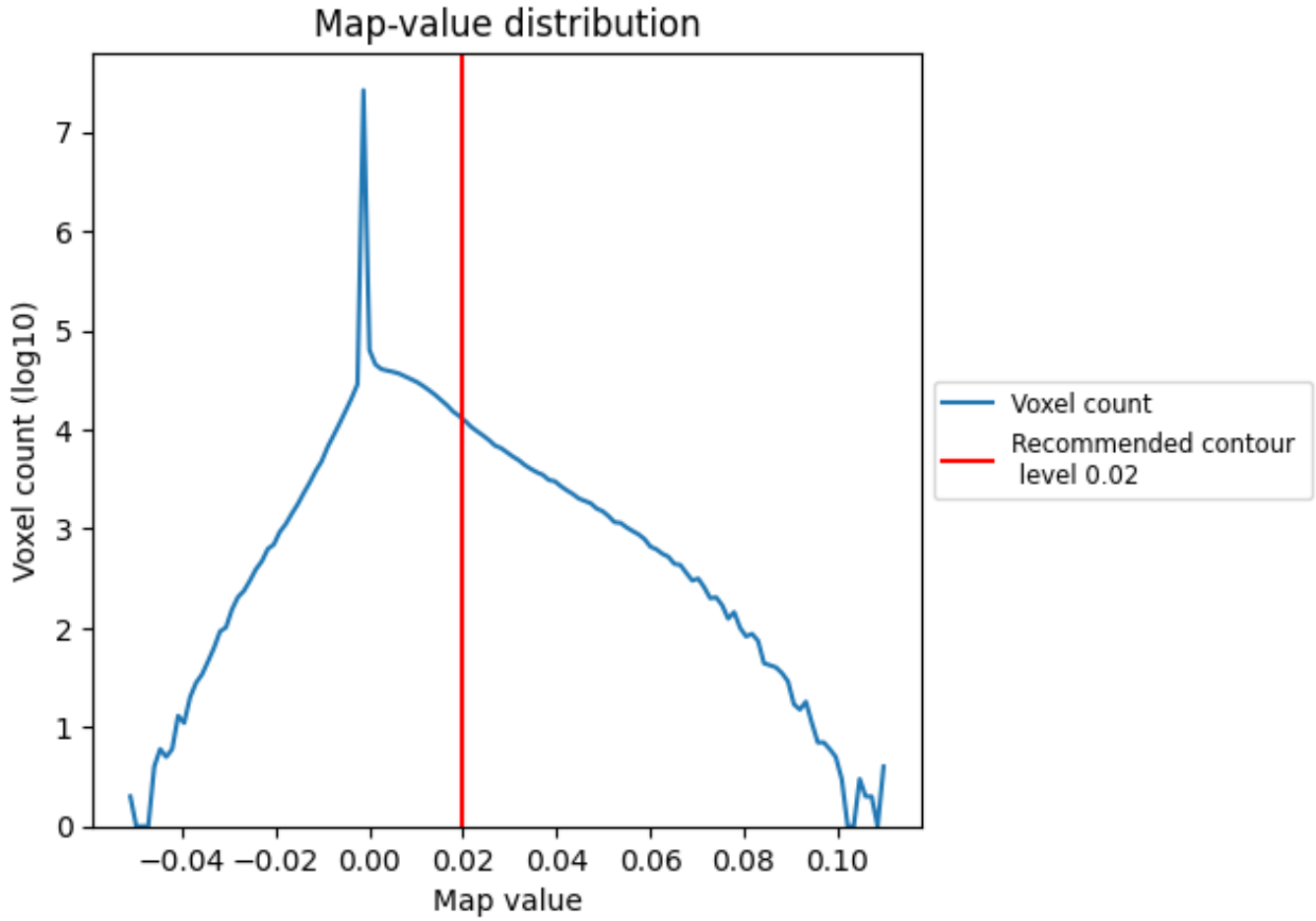
6.6 Mask visualisation (i)

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

7 Map analysis

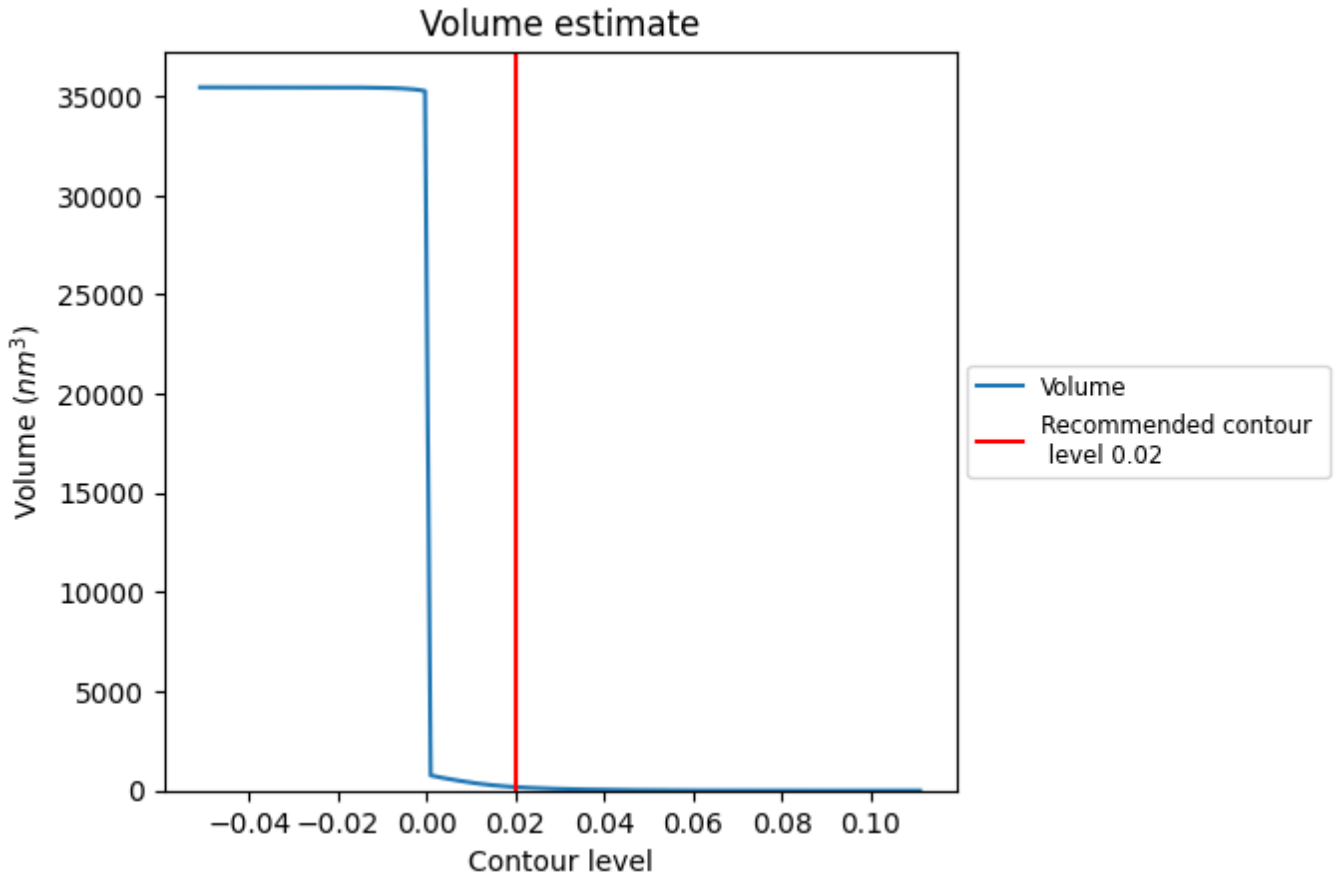
This section contains the results of statistical analysis of the map.

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.

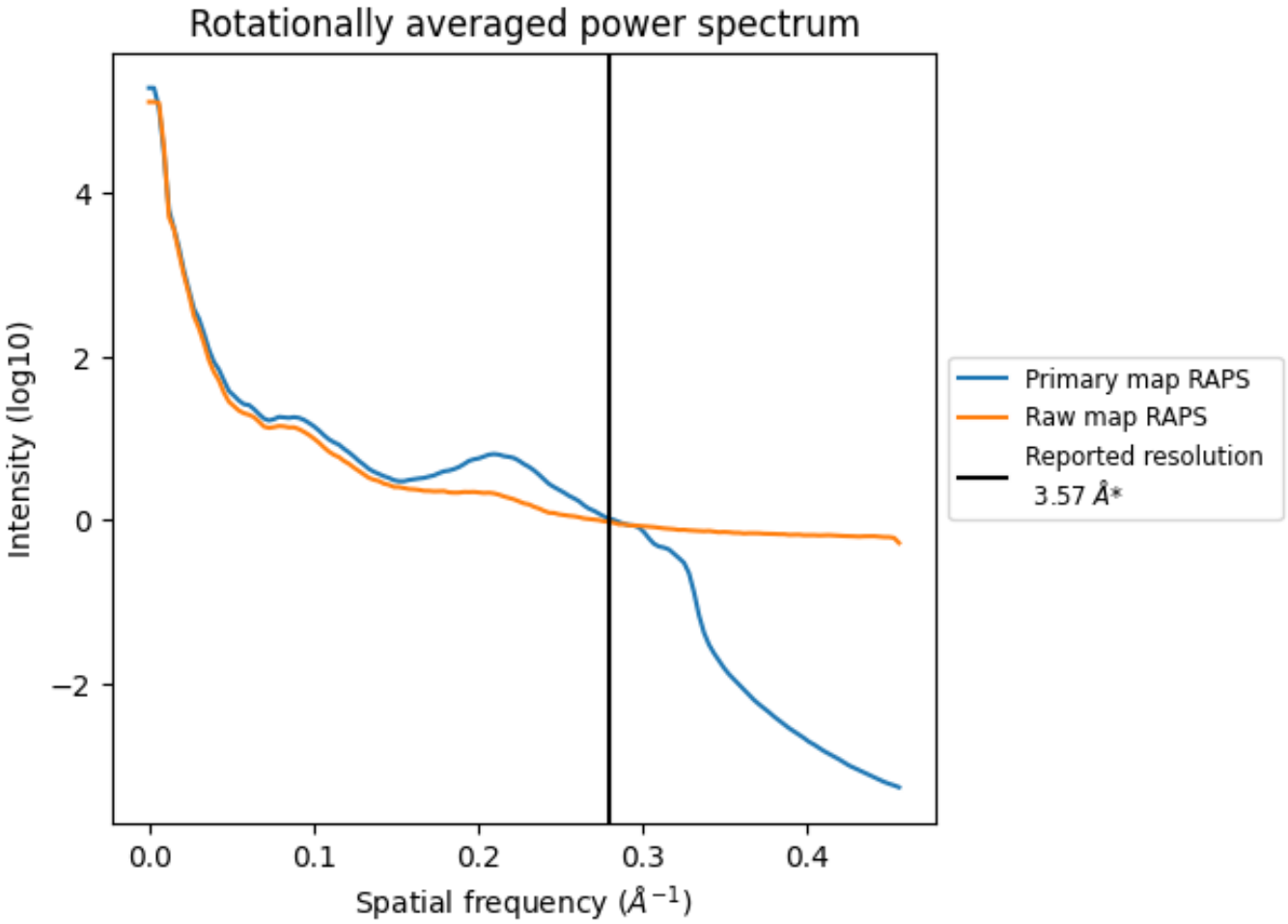
7.2 Volume estimate



The volume at the recommended contour level is 177 nm^3; this corresponds to an approximate mass of 159 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)

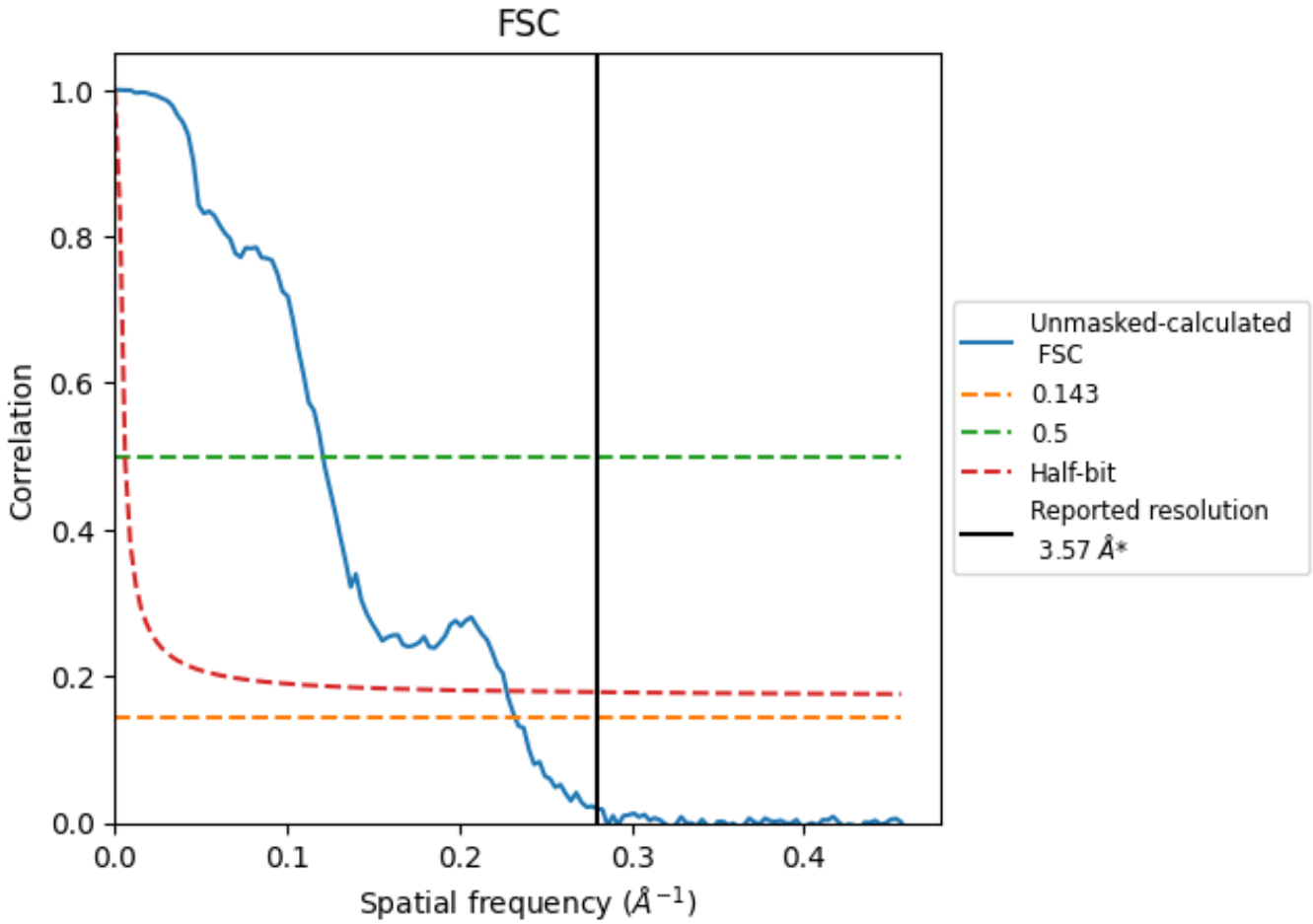


*Reported resolution corresponds to spatial frequency of 0.280 $Å^{-1}$

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 0.280 Å^{-1}

8.2 Resolution estimates (i)

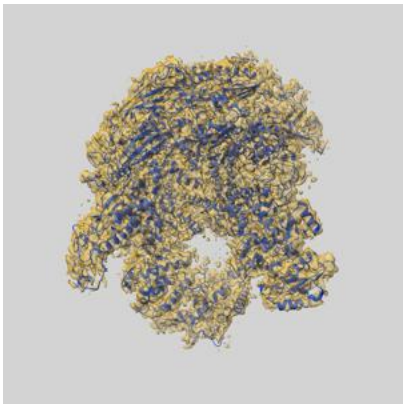
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.57	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.30	8.28	4.40

*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 3.57 by more than 10 %

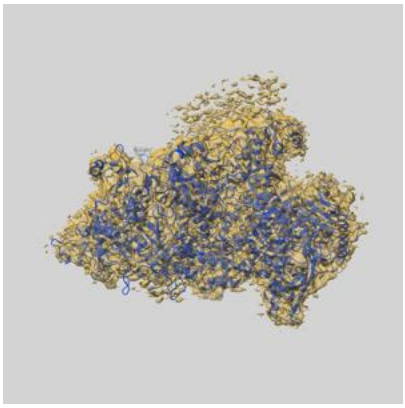
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-34820 and PDB model 8HIL. Per-residue inclusion information can be found in section 3 on page 7.

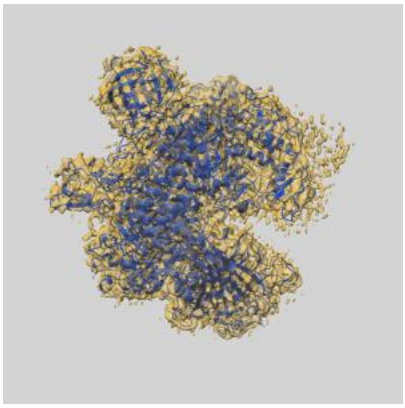
9.1 Map-model overlay



X



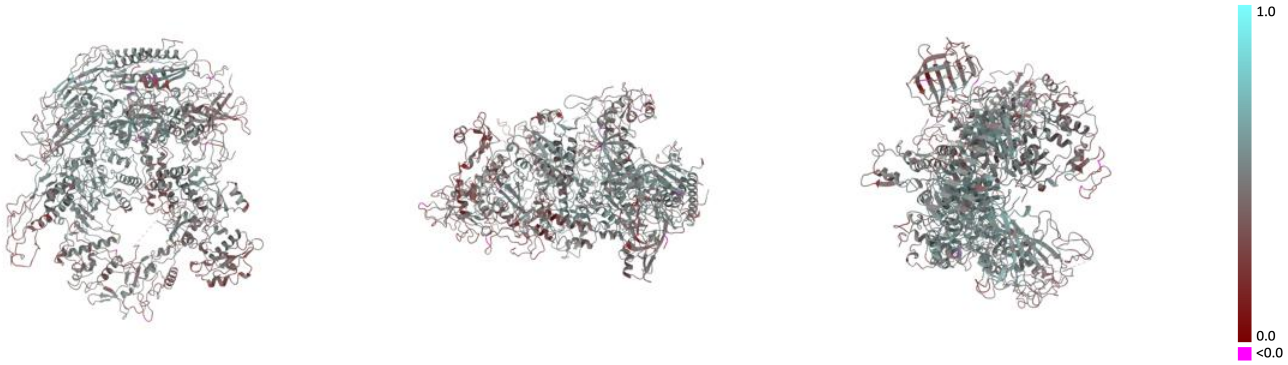
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.02 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.

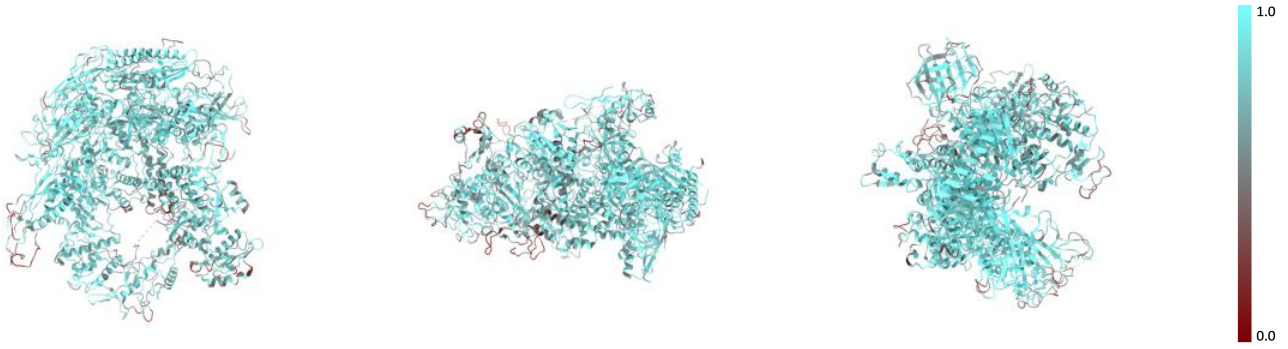
9.2 Q-score mapped to coordinate model (i)



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.

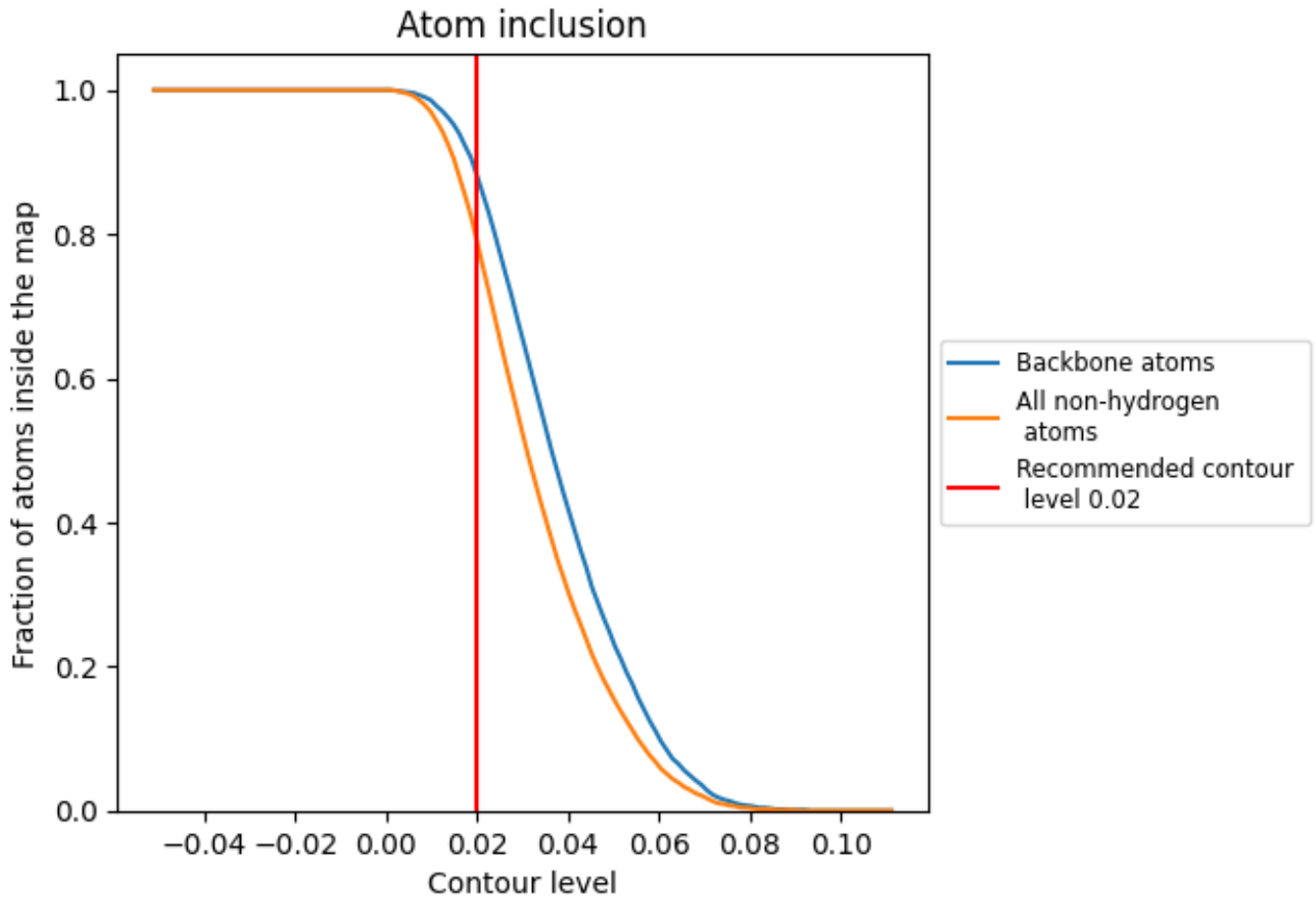
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.02).

9.4 Atom inclusion (i)



At the recommended contour level, 88% of all backbone atoms, 79% 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 (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7900	0.4610
A	0.7660	0.4430
B	0.8380	0.4900
C	0.8510	0.4980
E	0.7020	0.4070
F	0.7550	0.4380
H	0.7150	0.3840
I	0.5100	0.3660
J	0.9180	0.5270
K	0.8590	0.4990
L	0.8030	0.4620