Full wwPDB EM Validation Report ⓘ

Apr 20, 2026 – 02:51 PM EDT

PDB ID	:	10MB / pdb_000010mb
EMDB ID	:	EMD-75280
Title	:	Open1 Eco-ePEC: Cryo-EM structure of Eco RNAP his-elemental paused elongation complex with an open active site (open TL, SI3 and RH-FL)
Authors	:	Dhingra, Y.; Darst, S.A.
Deposited on	:	2026-01-27
Resolution	:	2.90 Å(reported)

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

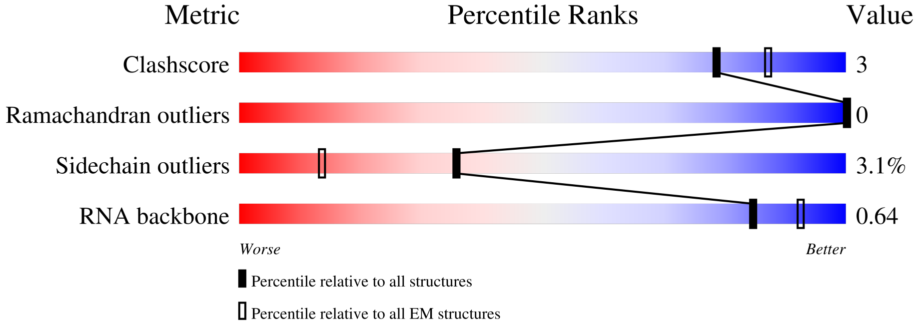
EMDB validation analysis	:	0.0.1.dev132
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

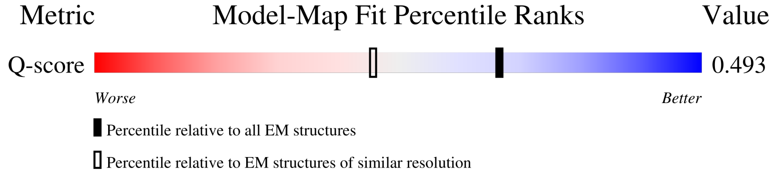
1 Overall quality at a glance (i)

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

The reported resolution of this entry is 2.90 Å.

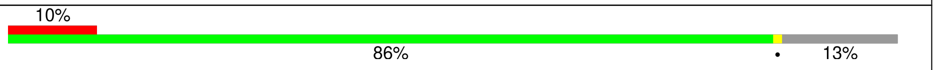
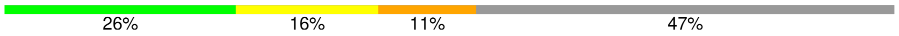
Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.





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	-
RNA backbone	8273	3508	-
Q-score	-	25397	13054 (2.40 - 3.40)

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	B	32	
2	K	91	
3	R	19	

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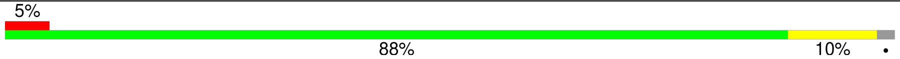
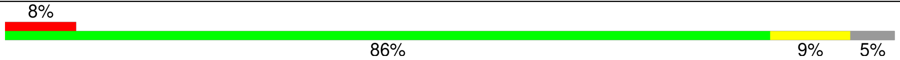
Mol	Chain	Length	Quality of chain
4	A	32	
5	G	329	
5	H	329	
6	I	1342	
7	J	1407	

2 Entry composition ⓘ

There are 11 unique types of molecules in this entry. The entry contains 26767 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 DNA chain called DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	B	30	608	290	109	179	30	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	K	79	627	382	118	126	1	0	0

- Molecule 3 is a RNA chain called RNA (5’-R(P*GP*AP*UP*GP*UP*GP*UP*GP*CP*U)-3’).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	R	10	214	95	36	73	10	0	0

- Molecule 4 is a DNA chain called DNA (5’-D(*CP*GP*TP*CP*CP*TP*TP*TP*CP*GP*GP*AP*AP*GP*AP*GP*AP*TP*TP*CP*AP*GP*A)-3’).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
4	A	23	470	225	87	136	22	0	0

- Molecule 5 is a protein called DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	G	218	1679	1051	297	325	6	0	0
			Total	C	N	O	S		
5	H	218	1681	1050	297	328	6	0	0

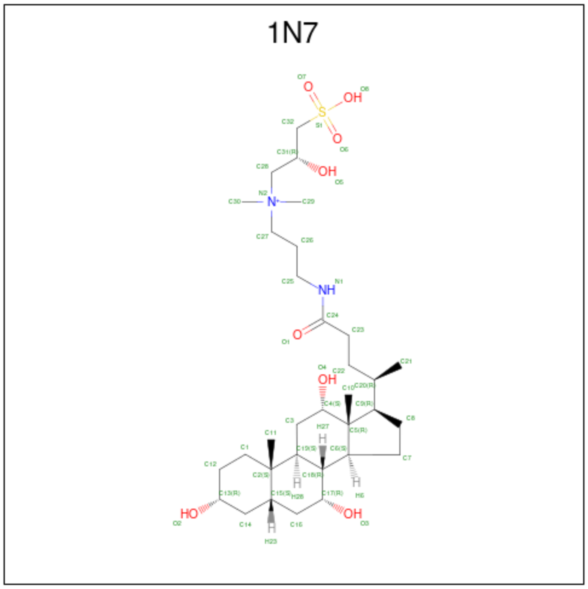
- Molecule 6 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	I	1316	10381	6514	1810	2014	43	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	J	1337	10403	6536	1856	1961	50	0	0

- Molecule 8 is CHAPSO (CCD ID: 1N7) (formula: $C_{32}H_{59}N_2O_8S$).



Mol	Chain	Residues	Atoms			AltConf
			Total	C	O	
8	I	1	27	24	3	0

- Molecule 9 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
9	J	1	1	1	0

- Molecule 10 is ZINC ION (CCD ID: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
10	J	2	2	2	0

- Molecule 11 is water.

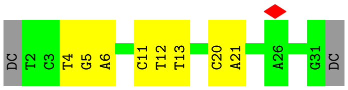
Mol	Chain	Residues	Atoms	AltConf
11	B	17	Total O 17 17	0
11	K	6	Total O 6 6	0
11	R	15	Total O 15 15	0
11	A	6	Total O 6 6	0
11	G	44	Total O 44 44	0
11	H	41	Total O 41 41	0
11	I	310	Total O 310 310	0
11	J	235	Total O 235 235	0

3 Residue-property plots

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.

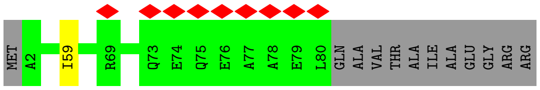
- Molecule 1: DNA

Chain B:



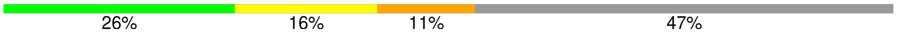
- Molecule 2: DNA-directed RNA polymerase subunit omega

Chain K:



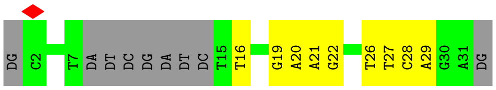
- Molecule 3: RNA (5'-R(P*GP*AP*UP*GP*UP*GP*UP*GP*CP*U)-3')

Chain R:



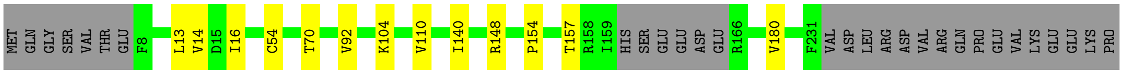
- Molecule 4: DNA (5'-D(*CP*GP*TP*CP*CP*TP*TP*TP*CP*GP*GP*AP*AP*GP*AP*GP *AP*TP*TP*CP*AP*GP*A)-3')

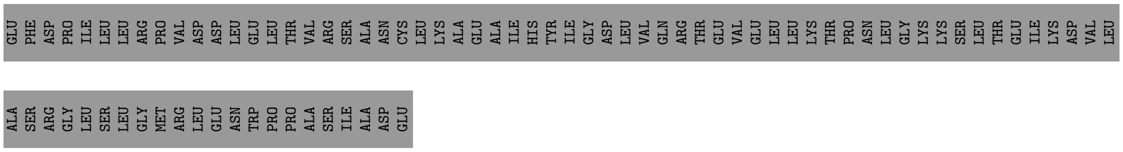
Chain A:



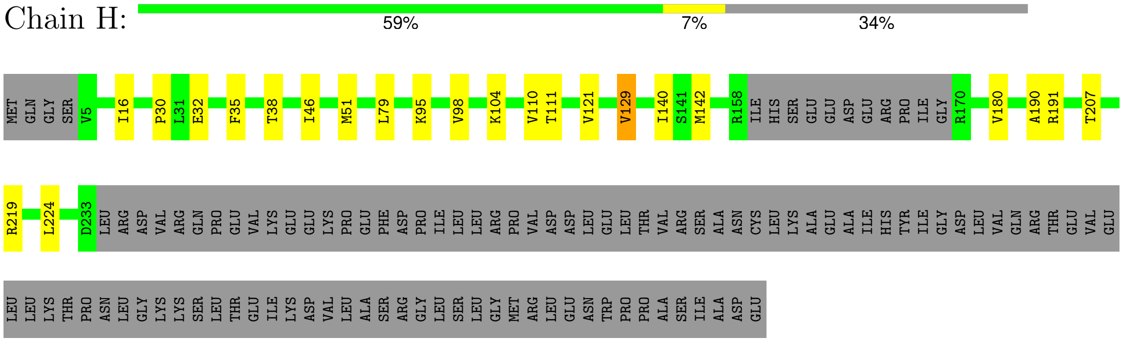
- Molecule 5: DNA-directed RNA polymerase subunit alpha

Chain G:

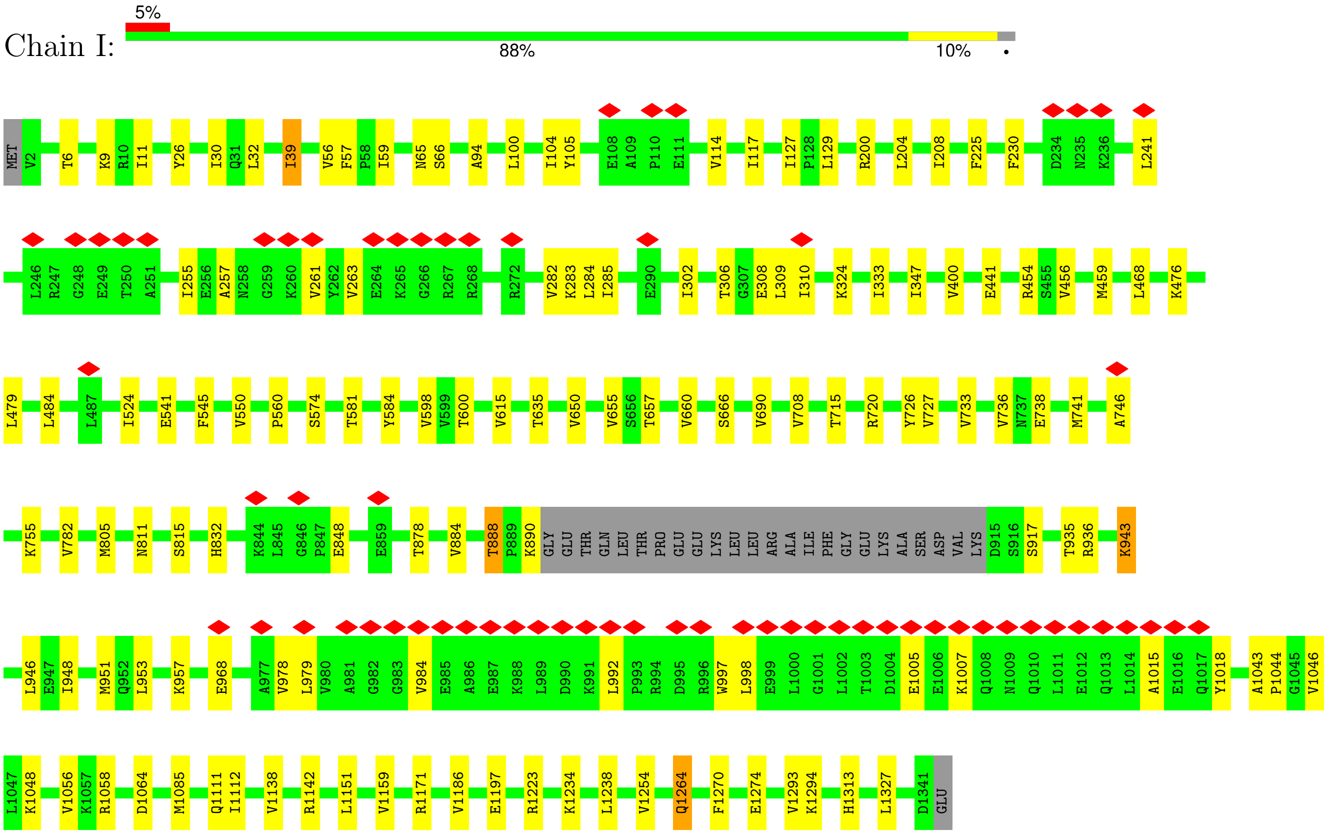




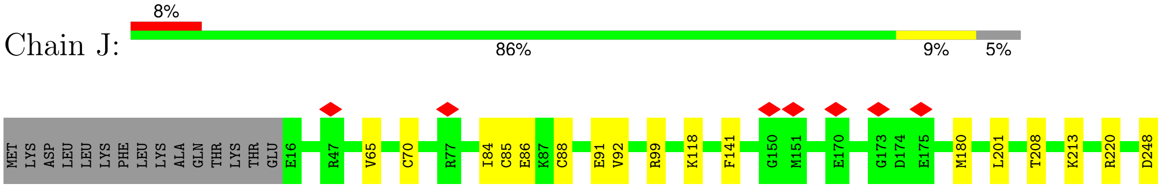
- Molecule 5: DNA-directed RNA polymerase subunit alpha

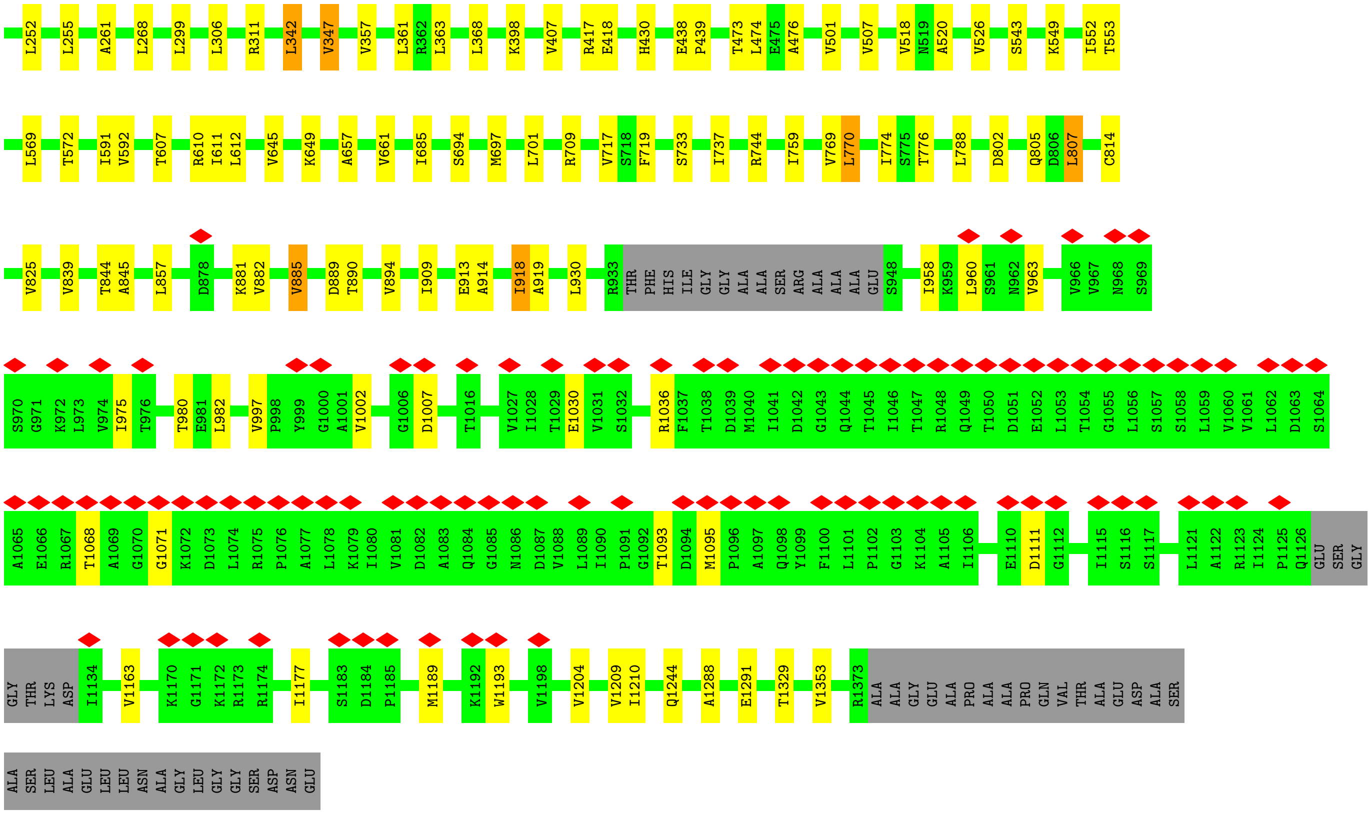


- Molecule 6: DNA-directed RNA polymerase subunit beta



- Molecule 7: DNA-directed RNA polymerase subunit beta’




L252
L255
A261
L268
L299
L306
R311
L342
V347
V357
L361
R362
L363
L368
K398
V407
R417
E418
H430
E438
P439
T473
L474
E475
A476
V501
V507
V518
N519
A520
V526
S543
K549
I552
T553
L569
T572
I591
V592
T607
R610
I611
L612
V645
K649
A657
V661
I685
S694
M697
L701
R709
V717
S718
F719
S733
I737
R744
I759
V769
L770
I774
S775
T776
L788
D802
Q805
D806
L807
C814
V825
V839
T844
A845
L857
D878
K881
V882
V885
D889
T890
V894
I909
E913
A914
I918
A919
L930
R933
THR
PHE
HIS
ILE
GLY
GLY
ALA
ALA
SER
ARG
ALA
ALA
ALA
GLU
S948
I958
K959
L960
S961
N962
V963
V966
V967
N968
S969
S970
G971
K972
L973
V974
I975
T976
T980
E981
L982
V997
P998
Y999
G1000
A1001
V1002
G1006
D1007
T1016
V1027
I1028
T1029
E1030
V1031
S1032
R1036
F1037
T1038
D1039
M1040
I1041
D1042
G1043
Q1044
T1045
I1046
T1047
R1048
Q1049
T1050
D1051
E1052
L1053
T1054
G1055
L1056
S1057
S1058
L1059
V1060
V1061
L1062
D1063
S1064
A1065
E1066
R1067
T1068
A1069
G1070
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K1079
I1080
V1081
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A1083
Q1084
G1085
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D1087
V1088
L1089
I1090
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G1092
T1093
D1094
M1095
P1096
A1097
Q1098
Y1099
F1100
L1101
P1102
G1103
K1104
A1105
I1106
E1110
D1111
G1112
I1115
S1116
S1117
L1121
A1122
R1123
I1124
P1125
Q1126
GLU
SER
GLY
GLY
THR
LYS
ASP
I1134
V1163
K1170
G1171
K1172
R1173
R1174
I1177
S1183
D1184
P1185
M1189
K1192
W1193
V1198
V1204
V1209
I1210
Q1244
A1288
E1291
T1329
V1353
R1373
ALA
ALA
GLY
GLU
ALA
PRO
ALA
ALA
PRO
GLN
VAL
THR
ALA
GLU
ASP
ALA
SER
ALA
SER
LEU
ALA
GLU
LEU
LEU
ASN
ALA
GLY
LEU
GLY
GLY
SER
ASP
ASN
GLU

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	248721	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 $(e^-/\text{Å}^2)$	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.503	Depositor
Minimum map value	-0.348	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.012	Depositor
Recommended contour level	0.02	Depositor
Map size (Å)	259.58398, 259.58398, 259.58398	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.67599994, 0.67599994, 0.67599994	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: ZN, 1N7, MG

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	B	0.29	0/680	0.47	0/1045
2	K	0.08	0/629	0.20	0/847
3	R	0.13	0/238	0.32	0/369
4	A	0.15	0/526	0.31	0/808
5	G	0.09	0/1699	0.27	0/2302
5	H	0.09	0/1700	0.26	0/2304
6	I	0.10	0/10547	0.26	0/14232
7	J	0.10	0/10560	0.25	0/14257
All	All	0.11	0/26579	0.27	0/36164

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	B	608	0	338	7	0
2	K	627	0	634	0	0
3	R	214	0	106	5	0
4	A	470	0	262	7	0
5	G	1679	0	1717	6	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	H	1681	0	1714	11	0
6	I	10381	0	10392	64	0
7	J	10403	0	10628	57	0
8	I	27	0	39	0	0
9	J	1	0	0	0	0
10	J	2	0	0	0	0
11	A	6	0	0	0	0
11	B	17	0	0	0	0
11	G	44	0	0	0	0
11	H	41	0	0	0	0
11	I	310	0	0	1	0
11	J	235	0	0	0	0
11	K	6	0	0	0	0
11	R	15	0	0	0	0
All	All	26767	0	25830	144	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 (144) 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)
6:I:560:PRO:HB2	7:J:776:THR:HG21	1.61	0.82
6:I:720:ARG:HE	6:I:736:VAL:HG11	1.51	0.75
6:I:738:GLU:HA	6:I:741:MET:HE2	1.71	0.72
1:B:13:DT:H3	4:A:19:DG:H1	0.78	0.72
7:J:85:CYS:HB3	7:J:88:CYS:SG	2.29	0.72
1:B:6:DA:H5”	7:J:1189:MET:HE1	1.73	0.68
5:H:104:LYS:HD3	5:H:110:VAL:HG22	1.79	0.63
3:R:10:G:H2’	3:R:11:A:C8	2.34	0.63
7:J:1093:THR:HG22	7:J:1095:MET:H	1.65	0.61
6:I:9:LYS:HG2	6:I:1171:ARG:HE	1.66	0.61
6:I:978:VAL:HG13	6:I:1007:LYS:HG3	1.82	0.60
7:J:417:ARG:HG2	7:J:418:GLU:HG3	1.85	0.58
7:J:268:LEU:HD13	7:J:306:LEU:HA	1.86	0.58
4:A:26:DT:H2’	4:A:27:DT:H71	1.86	0.57
6:I:104:ILE:HG21	6:I:484:LEU:HB3	1.87	0.56
6:I:1151:LEU:HD11	6:I:1197:GLU:HG2	1.88	0.55
6:I:1294:LYS:HG3	7:J:347:VAL:HG22	1.88	0.55
7:J:85:CYS:CB	7:J:88:CYS:SG	2.91	0.55
5:H:140:ILE:HD11	5:H:142:MET:HE3	1.88	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:I:241:LEU:HD13	6:I:285:ILE:HG13	1.88	0.55
7:J:744:ARG:HB3	7:J:759:ILE:HB	1.87	0.55
5:H:51:MET:HE1	5:H:219:ARG:HB3	1.88	0.55
7:J:70:CYS:HB2	7:J:88:CYS:SG	2.47	0.55
6:I:255:ILE:HB	6:I:263:VAL:HG21	1.90	0.54
7:J:958:ILE:HG23	7:J:982:LEU:HD11	1.89	0.54
6:I:306:THR:HG23	6:I:308:GLU:H	1.73	0.54
6:I:230:PHE:HB2	6:I:333:ILE:HB	1.91	0.53
7:J:208:THR:HG21	7:J:213:LYS:HD3	1.91	0.53
7:J:1204:VAL:HG11	7:J:1210:ILE:HD11	1.91	0.53
6:I:936:ARG:HH22	6:I:1044:PRO:HA	1.74	0.53
7:J:118:LYS:HB3	7:J:311:ARG:HD3	1.91	0.52
7:J:1068:THR:HG23	7:J:1071:GLY:H	1.74	0.52
6:I:59:ILE:HD11	6:I:476:LYS:HD2	1.92	0.52
6:I:848:GLU:HG2	6:I:888:THR:HA	1.91	0.52
1:B:13:DT:O4	4:A:19:DG:O6	2.27	0.52
7:J:885:VAL:HG22	7:J:894:VAL:HG21	1.91	0.51
6:I:948:ILE:HA	6:I:951:MET:HE2	1.93	0.51
6:I:811:ASN:HA	6:I:815:SER:HB2	1.93	0.50
6:I:726:TYR:HB3	6:I:733:VAL:HB	1.93	0.50
6:I:309:LEU:H	6:I:309:LEU:HD23	1.77	0.49
3:R:17:G:H2'	3:R:18:C:C6	2.48	0.49
4:A:20:DA:H2"	4:A:21:DA:C8	2.48	0.49
1:B:20:DC:H2'	1:B:21:DA:H8	1.78	0.49
7:J:960:LEU:HD23	7:J:1007:ASP:HB3	1.95	0.48
5:H:32:GLU:HB3	5:H:35:PHE:CD1	2.49	0.48
5:G:110:VAL:HG21	5:G:140:ILE:HD11	1.95	0.48
6:I:968:GLU:HG2	6:I:1018:TYR:HE1	1.79	0.48
6:I:1058:ARG:HH11	6:I:1238:LEU:HD22	1.78	0.48
6:I:1223:ARG:HH22	7:J:719:PHE:HB3	1.78	0.48
5:G:104:LYS:HG2	5:G:110:VAL:HG22	1.95	0.47
7:J:918:ILE:HG13	7:J:919:ALA:N	2.28	0.47
6:I:1270:PHE:CZ	6:I:1274:GLU:HB3	2.50	0.47
6:I:832:HIS:CD2	6:I:1058:ARG:HG3	2.49	0.47
6:I:1111:GLN:HG3	6:I:1112:ILE:HD12	1.97	0.47
6:I:1313:HIS:HB2	7:J:474:LEU:HD13	1.96	0.47
7:J:909:ILE:HD11	7:J:913:GLU:HG2	1.97	0.47
6:I:400:VAL:HG22	6:I:584:TYR:HD1	1.80	0.47
5:H:79:LEU:HD11	7:J:526:VAL:HG21	1.97	0.46
5:H:98:VAL:HG11	5:H:121:VAL:HG21	1.97	0.46
6:I:666:SER:HA	6:I:1186:VAL:HG11	1.96	0.46

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Atom-1	**Atom-2**	**Interatomic distance (Å)**	**Clash overlap (Å)**
5:H:46:ILE:HD12	5:H:224:LEU:HB2	1.97	0.46
7:J:255:LEU:HD21	7:J:261:ALA:HB2	1.96	0.46
7:J:591:ILE:HG23	7:J:592:VAL:HG13	1.96	0.46
5:G:154:PRO:HG2	5:G:157:THR:HB	1.96	0.46
3:R:18:C:H2'	3:R:19:U:C6	2.50	0.46
7:J:1163:VAL:HG23	7:J:1177:ILE:HG12	1.98	0.46
3:R:17:G:H2'	3:R:18:C:H6	1.81	0.46
6:I:524:ILE:HD12	6:I:708:VAL:HG13	1.97	0.45
7:J:84:ILE:HG12	7:J:91:GLU:HB3	1.97	0.45
7:J:141:PHE:HA	7:J:180:MET:HE2	1.97	0.45
6:I:225:PHE:HE2	6:I:347:ILE:HB	1.80	0.45
1:B:4:DT:H2"	1:B:5:DG:C8	2.51	0.45
7:J:930:LEU:HD23	7:J:1244:GLN:HG3	1.98	0.45
5:H:111:THR:HG22	5:H:129:VAL:HA	1.99	0.45
7:J:694:SER:O	7:J:697:MET:HG3	2.16	0.45
6:I:283:LYS:HG3	6:I:284:LEU:HD12	1.98	0.45
6:I:953:LEU:HG	6:I:957:LYS:HE3	1.99	0.45
7:J:99:ARG:HB3	7:J:248:ASP:HB2	1.99	0.45
7:J:473:THR:HG23	7:J:476:ALA:H	1.81	0.45
4:A:21:DA:H2"	4:A:22:DG:H5'	1.98	0.45
7:J:201:LEU:HD11	7:J:220:ARG:HH11	1.82	0.45
7:J:520:ALA:HB1	7:J:543:SER:HB3	1.99	0.45
1:B:20:DC:H2'	1:B:21:DA:C8	2.52	0.45
5:H:180:VAL:HA	5:H:207:THR:HG22	1.99	0.45
5:G:13:LEU:HD21	5:G:16:ILE:HG13	1.98	0.44
7:J:1288:ALA:O	7:J:1291:GLU:HG3	2.16	0.44
1:B:11:DC:H2"	1:B:12:DT:H71	2.00	0.44
7:J:770:LEU:O	7:J:774:ILE:HG13	2.17	0.43
3:R:10:G:H2'	3:R:11:A:H8	1.80	0.43
6:I:660:VAL:HG11	7:J:769:VAL:HG13	2.00	0.43
7:J:607:THR:HA	7:J:610:ARG:HG2	2.00	0.43
6:I:26:TYR:HE2	6:I:32:LEU:HD12	1.82	0.43
6:I:741:MET:SD	6:I:746:ALA:HB1	2.59	0.43
6:I:884:VAL:O	6:I:917:SER:HB3	2.18	0.43
6:I:310:ILE:HG23	6:I:324:LYS:HE2	1.99	0.43
4:A:28:DC:H2"	4:A:29:DA:C8	2.53	0.43
6:I:66:SER:HB2	6:I:479:LEU:HD11	2.00	0.43
6:I:94:ALA:HB2	6:I:129:LEU:HD11	2.00	0.43
7:J:963:VAL:HG23	7:J:975:ILE:HD13	2.00	0.43
6:I:57:PHE:CZ	6:I:100:LEU:HD22	2.54	0.42
6:I:1005:GLU:HG3	6:I:1007:LYS:H	1.84	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:I:1043:ALA:O	6:I:1046:VAL:HG22	2.18	0.42
6:I:943:LYS:HA	6:I:946:LEU:HG	2.01	0.42
5:G:70:THR:HG21	6:I:755:LYS:HE2	2.01	0.42
7:J:1193:TRP:CD1	7:J:1193:TRP:H	2.38	0.42
5:H:30:PRO:HG3	5:H:190:ALA:HB1	2.00	0.42
6:I:1264:GLN:H	6:I:1264:GLN:HG2	1.62	0.42
7:J:611:ILE:HG22	7:J:612:LEU:HD12	2.02	0.42
5:H:95:LYS:HE2	5:H:98:VAL:HG22	2.01	0.42
6:I:454:ARG:HD2	6:I:459:MET:HG2	2.02	0.42
6:I:690:VAL:HG12	6:I:1234:LYS:O	2.20	0.42
7:J:814:CYS:HB3	7:J:890:THR:HG22	2.02	0.42
7:J:980:THR:HB	7:J:997:VAL:HB	2.01	0.42
6:I:302:ILE:HA	6:I:309:LEU:HA	2.02	0.42
7:J:661:VAL:HG12	7:J:685:ILE:HD11	2.02	0.41
7:J:975:ILE:HG21	7:J:997:VAL:HG12	2.01	0.41
6:I:6:THR:HA	6:I:9:LYS:HE2	2.02	0.41
6:I:1223:ARG:NH2	7:J:719:PHE:HB3	2.35	0.41
7:J:368:LEU:HD12	7:J:439:PRO:HB3	2.02	0.41
7:J:733:SER:O	7:J:737:ILE:HG12	2.20	0.41
6:I:943:LYS:HD3	6:I:943:LYS:H	1.86	0.41
7:J:342:LEU:HD12	7:J:342:LEU:HA	1.89	0.41
7:J:549:LYS:HB3	7:J:569:LEU:HD11	2.02	0.41
6:I:56:VAL:HB	6:I:468:LEU:HD23	2.01	0.41
7:J:438:GLU:HA	7:J:439:PRO:HD3	1.92	0.41
6:I:545:PHE:CZ	7:J:788:LEU:HD22	2.56	0.41
6:I:998:LEU:HD11	6:I:1015:ALA:HB2	2.02	0.41
7:J:807:LEU:HD23	7:J:807:LEU:HA	1.83	0.41
7:J:845:ALA:HB3	7:J:881:LYS:HG2	2.03	0.41
4:A:16:DT:H2”	6:I:200:ARG:HG3	2.02	0.41
6:I:39:ILE:HD11	6:I:127:ILE:HD12	2.03	0.41
6:I:204:LEU:HD12	6:I:208:ILE:HD12	2.03	0.41
6:I:935:THR:HG22	6:I:1048:LYS:HE2	2.03	0.41
6:I:1138:VAL:O	6:I:1142:ARG:HG3	2.21	0.41
6:I:257:ALA:HB1	6:I:282:VAL:HG21	2.03	0.40
7:J:914:ALA:O	7:J:918:ILE:HG23	2.21	0.40
7:J:657:ALA:O	7:J:661:VAL:HG13	2.21	0.40
5:G:54:CYS:SG	5:G:148:ARG:HG2	2.60	0.40
7:J:398:LYS:HE3	7:J:398:LYS:HB2	1.92	0.40
7:J:1036:ARG:HD2	7:J:1111:ASP:OD1	2.21	0.40
6:I:105:TYR:HA	6:I:114:VAL:HA	2.04	0.40
6:I:225:PHE:CE2	6:I:347:ILE:HB	2.56	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
6:I:805:MET:HE2	11:I:1515:HOH:O	2.20	0.40
6:I:992:LEU:HB3	6:I:997:TRP:HE1	1.87	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	
2	K	77/91 (85%)	74 (96%)	3 (4%)	0	100	100
5	G	214/329 (65%)	210 (98%)	4 (2%)	0	100	100
5	H	214/329 (65%)	208 (97%)	6 (3%)	0	100	100
6	I	1312/1342 (98%)	1283 (98%)	29 (2%)	0	100	100
7	J	1331/1407 (95%)	1298 (98%)	33 (2%)	0	100	100
All	All	3148/3498 (90%)	3073 (98%)	75 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	K	67/75 (89%)	66 (98%)	1 (2%)	57	84
5	G	185/286 (65%)	182 (98%)	3 (2%)	55	83

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
5	H	186/286 (65%)	182 (98%)	4 (2%)	45	77
6	I	1135/1157 (98%)	1099 (97%)	36 (3%)	34	68
7	J	1122/1168 (96%)	1082 (96%)	40 (4%)	31	65
All	All	2695/2972 (91%)	2611 (97%)	84 (3%)	36	69

All (84) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	K	59	ILE
5	G	14	VAL
5	G	92	VAL
5	G	180	VAL
5	H	16	ILE
5	H	38	THR
5	H	129	VAL
5	H	191	ARG
6	I	11	ILE
6	I	30	ILE
6	I	39	ILE
6	I	65	ASN
6	I	117	ILE
6	I	261	VAL
6	I	441	GLU
6	I	456	VAL
6	I	541	GLU
6	I	550	VAL
6	I	574	SER
6	I	581	THR
6	I	598	VAL
6	I	600	THR
6	I	615	VAL
6	I	635	THR
6	I	650	VAL
6	I	655	VAL
6	I	657	THR
6	I	715	THR
6	I	727	VAL
6	I	782	VAL
6	I	878	THR
6	I	888	THR
6	I	890	LYS

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Mol	Chain	Res	Type
6	I	943	LYS
6	I	979	LEU
6	I	984	VAL
6	I	1056	VAL
6	I	1064	ASP
6	I	1085	MET
6	I	1159	VAL
6	I	1254	VAL
6	I	1264	GLN
6	I	1293	VAL
6	I	1327	LEU
7	J	65	VAL
7	J	86	GLU
7	J	92	VAL
7	J	252	LEU
7	J	299	LEU
7	J	342	LEU
7	J	347	VAL
7	J	357	VAL
7	J	361	LEU
7	J	363	LEU
7	J	407	VAL
7	J	430	HIS
7	J	501	VAL
7	J	507	VAL
7	J	518	VAL
7	J	552	ILE
7	J	553	THR
7	J	572	THR
7	J	645	VAL
7	J	649	LYS
7	J	701	LEU
7	J	709	ARG
7	J	717	VAL
7	J	770	LEU
7	J	802	ASP
7	J	805	GLN
7	J	807	LEU
7	J	825	VAL
7	J	839	VAL
7	J	844	THR
7	J	857	LEU

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Mol	Chain	Res	Type
7	J	882	VAL
7	J	885	VAL
7	J	889	ASP
7	J	918	ILE
7	J	1002	VAL
7	J	1030	GLU
7	J	1209	VAL
7	J	1329	THR
7	J	1353	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (20) such sidechains are listed below:

Mol	Chain	Res	Type
2	K	31	GLN
5	G	147	GLN
6	I	173	ASN
6	I	618	GLN
6	I	808	ASN
6	I	932	GLN
6	I	1070	HIS
6	I	1090	ASN
6	I	1136	GLN
6	I	1244	HIS
6	I	1256	GLN
6	I	1299	ASN
7	J	424	ASN
7	J	560	ASN
7	J	720	ASN
7	J	817	HIS
7	J	1084	GLN
7	J	1086	ASN
7	J	1218	HIS
7	J	1249	ASN

5.3.3 RNA ⓘ

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
3	R	10/19 (52%)	1 (10%)	1 (10%)

All (1) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
3	R	11	A

All (1) RNA pucker outliers are listed below:

Mol	Chain	Res	Type
3	R	10	G

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

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

5.5 Carbohydrates (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

Of 4 ligands modelled in this entry, 3 are monoatomic - leaving 1 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
8	1N7	I	1401	-	30,30,46	0.40	0	47,48,72	0.79	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	1N7	I	1401	-	-	0/7/72/92	0/4/4/4

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.

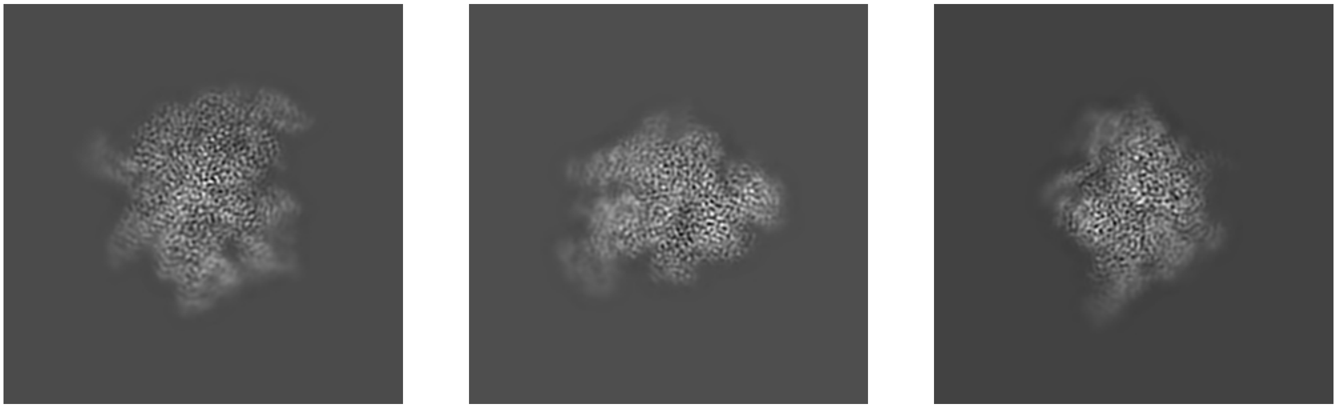
6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-75280. 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.

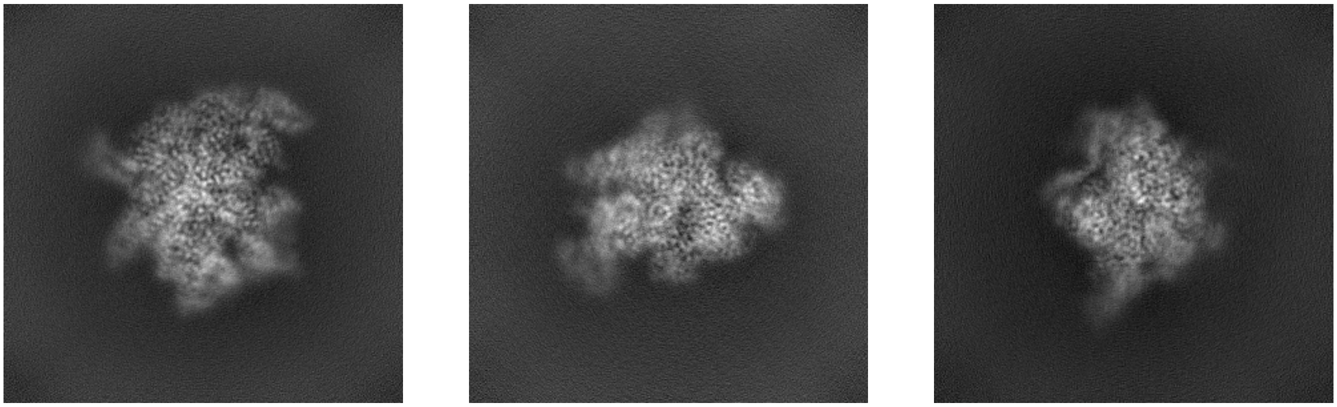
6.1 Orthogonal projections ⓘ

6.1.1 Primary map



X Y Z

6.1.2 Raw map

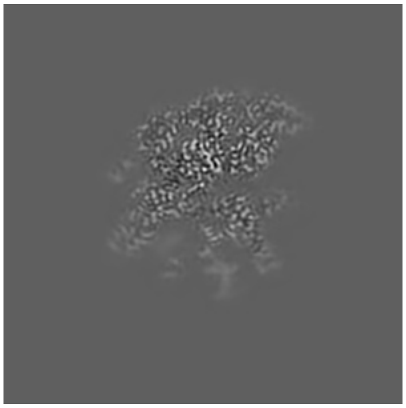


X Y Z

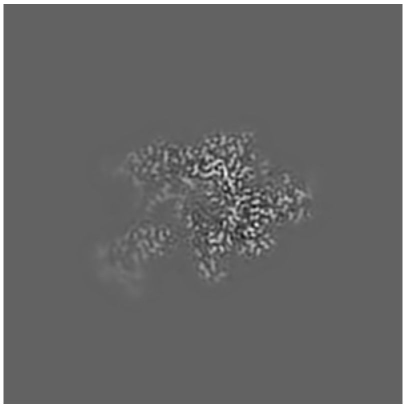
The images above show the map projected in three orthogonal directions.

6.2 Central slices

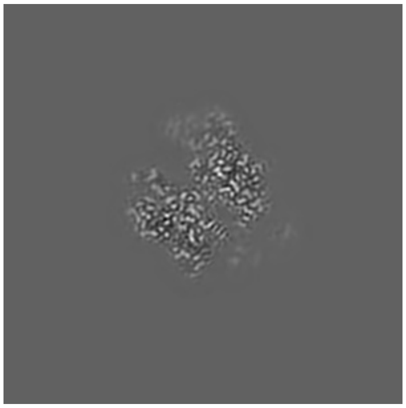
6.2.1 Primary map



X Index: 192

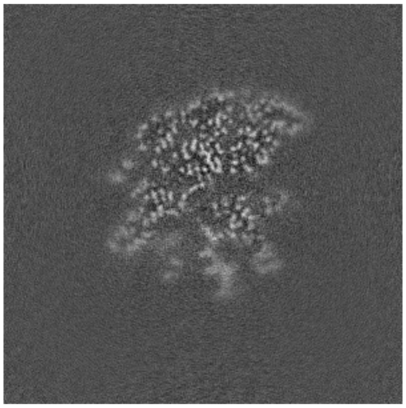


Y Index: 192

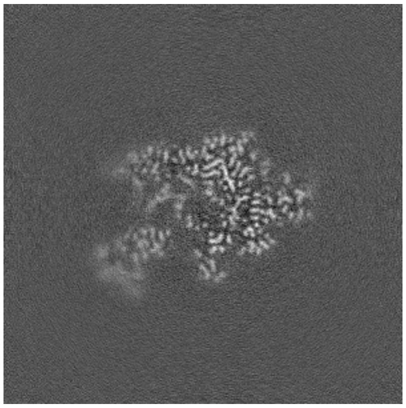


Z Index: 192

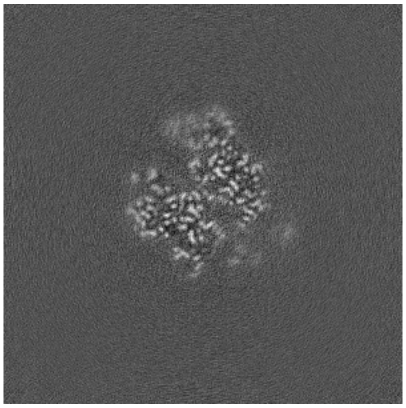
6.2.2 Raw map



X Index: 192



Y Index: 192

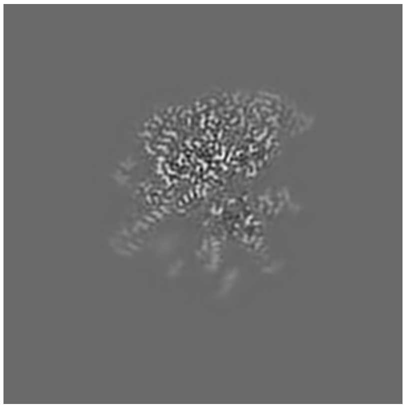


Z Index: 192

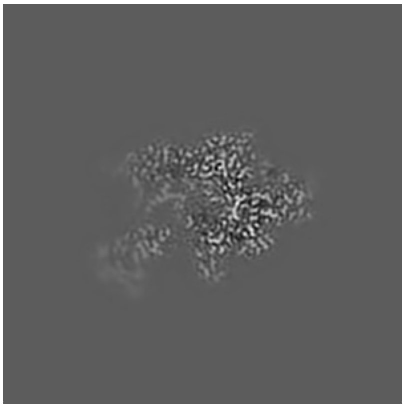
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices

6.3.1 Primary map



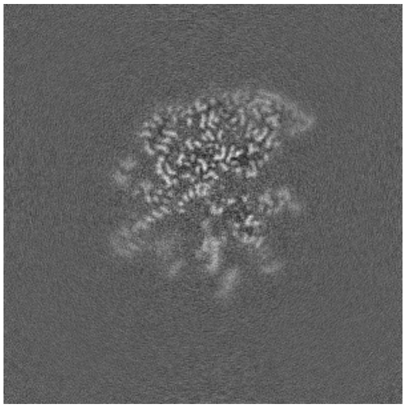
X Index: 196



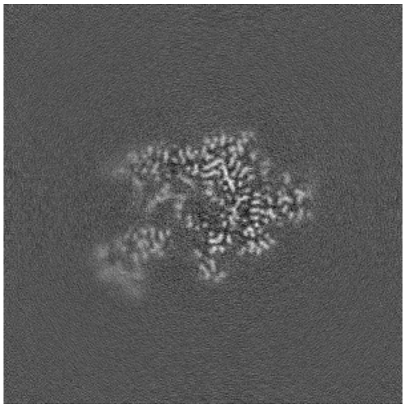
Y Index: 193

Z Index: 228

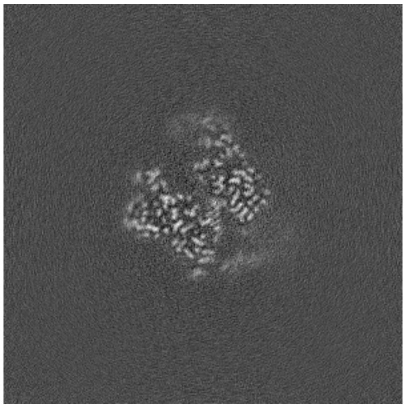
6.3.2 Raw map



X Index: 196



Y Index: 192

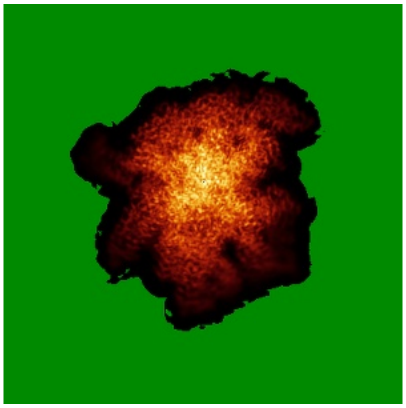


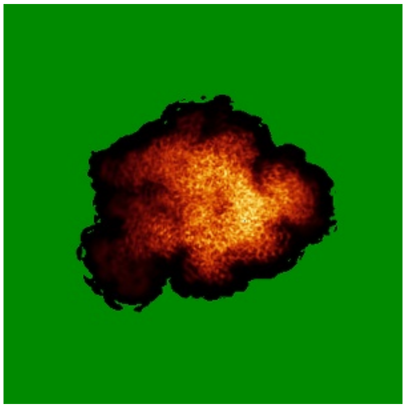
Z Index: 198

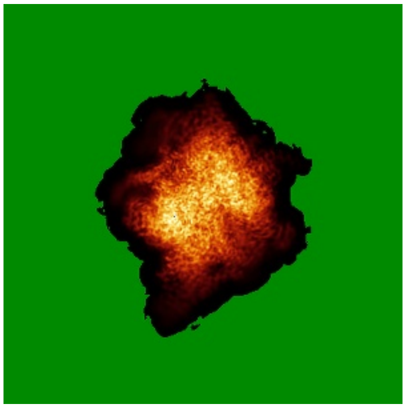
The images above show the largest variance slices of the map in three orthogonal directions.

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

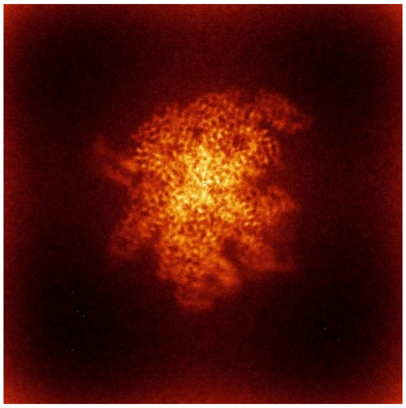
6.4.1 Primary map

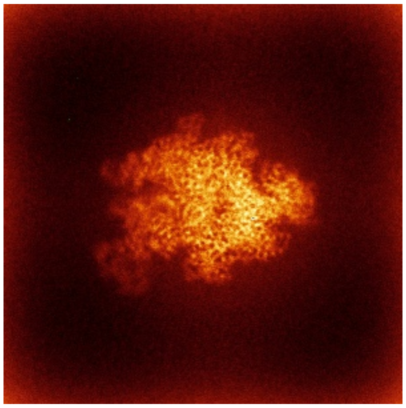

X

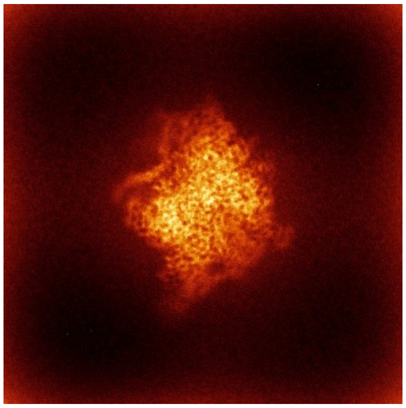

Y


Z

6.4.2 Raw map


X

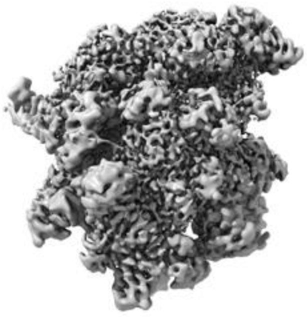

Y

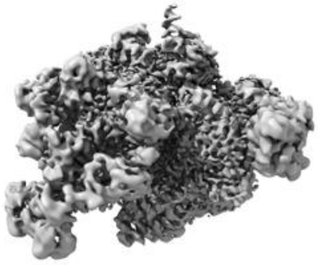

Z

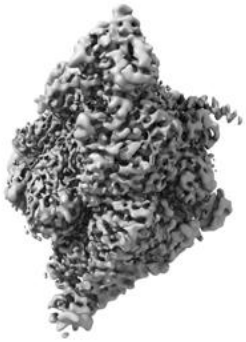
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

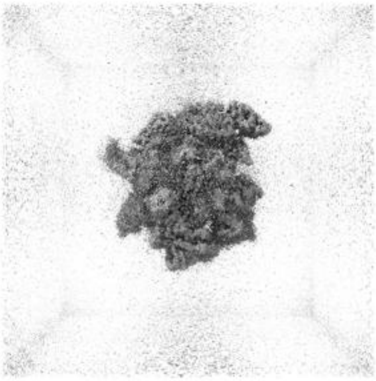

X

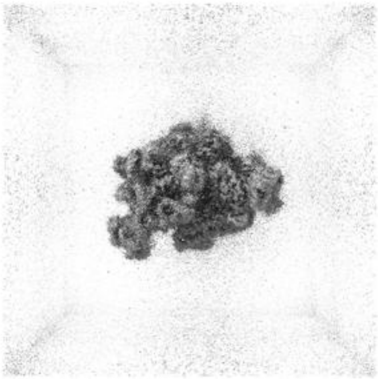

Y

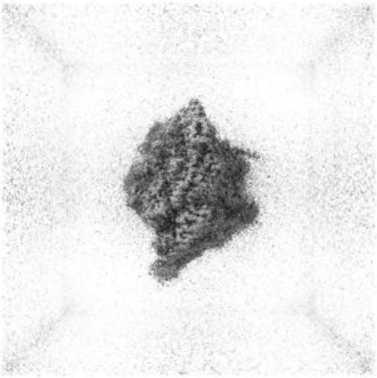

Z

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.

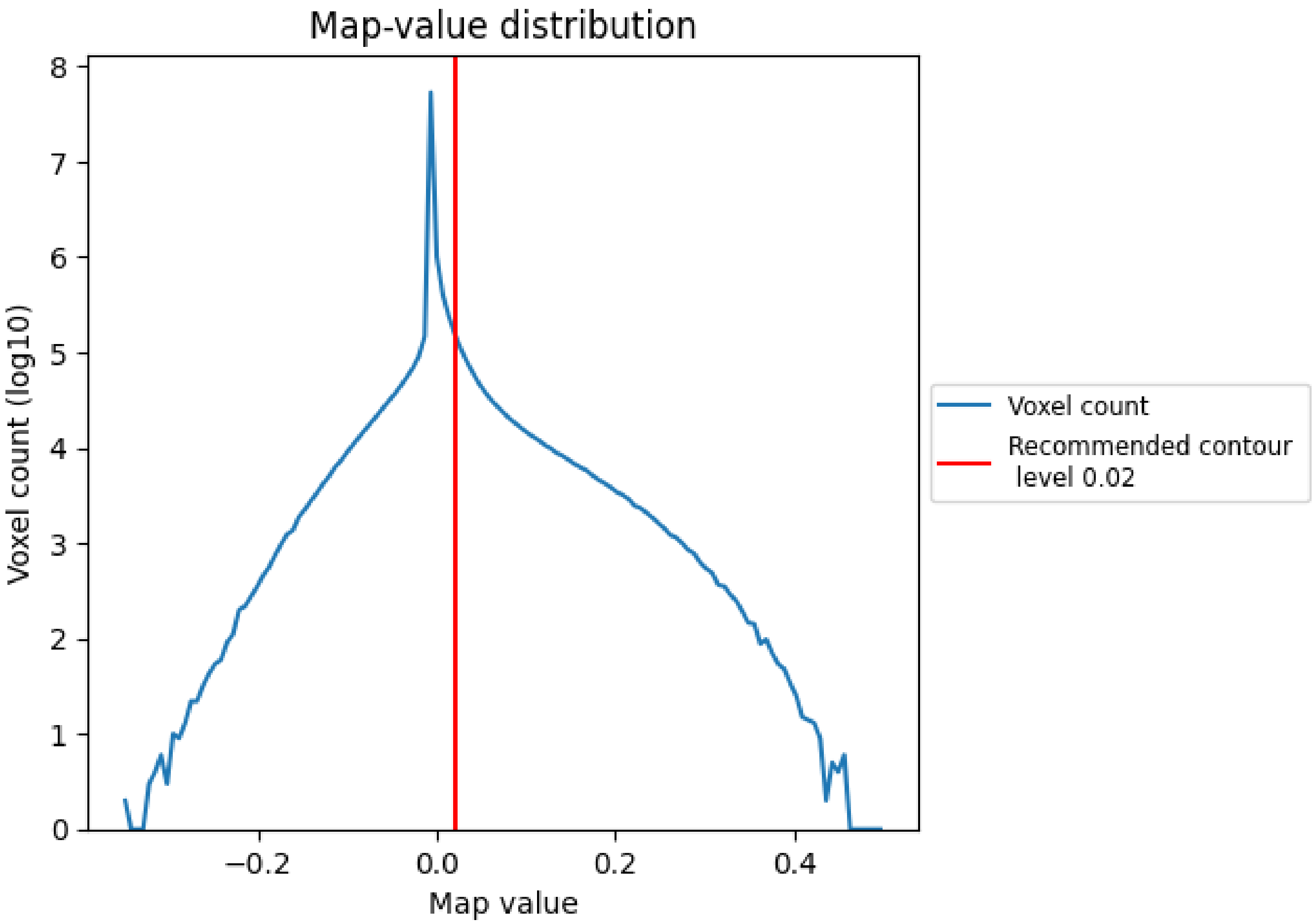
6.6 Mask visualisation (i)

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

7 Map analysis ⓘ

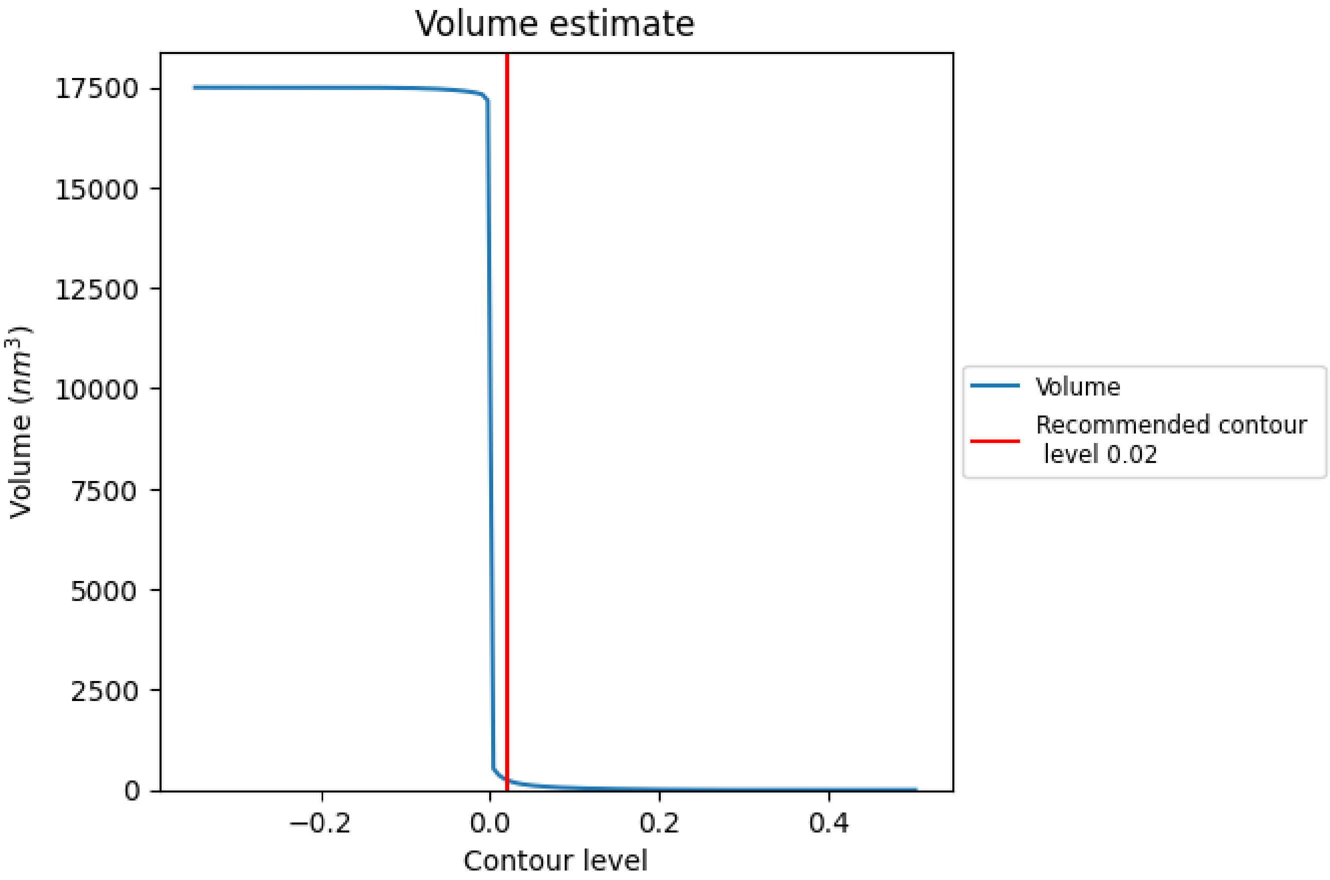
This section contains the results of statistical analysis of the map.

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.

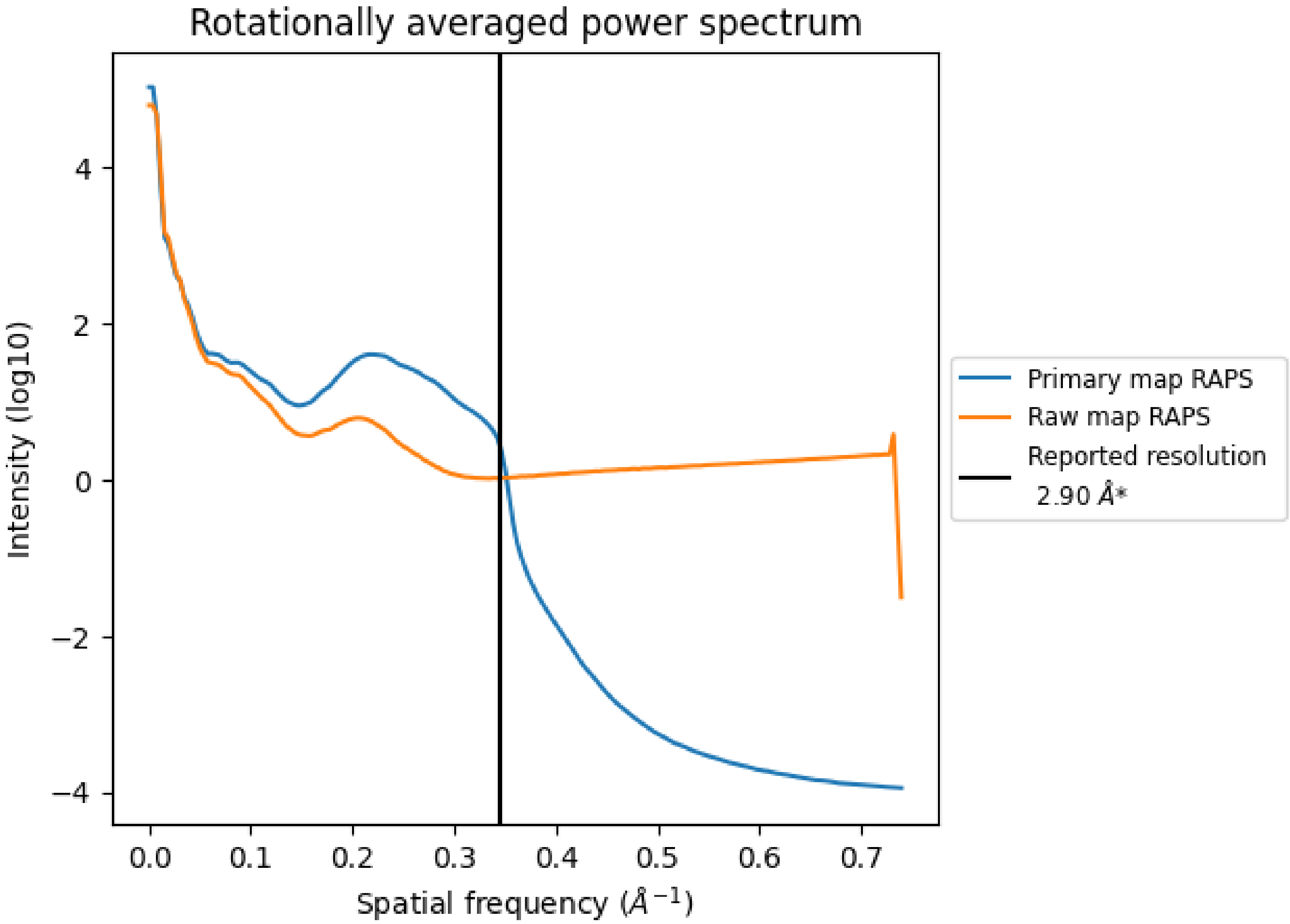
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 249 nm^3; this corresponds to an approximate mass of 225 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 ⓘ

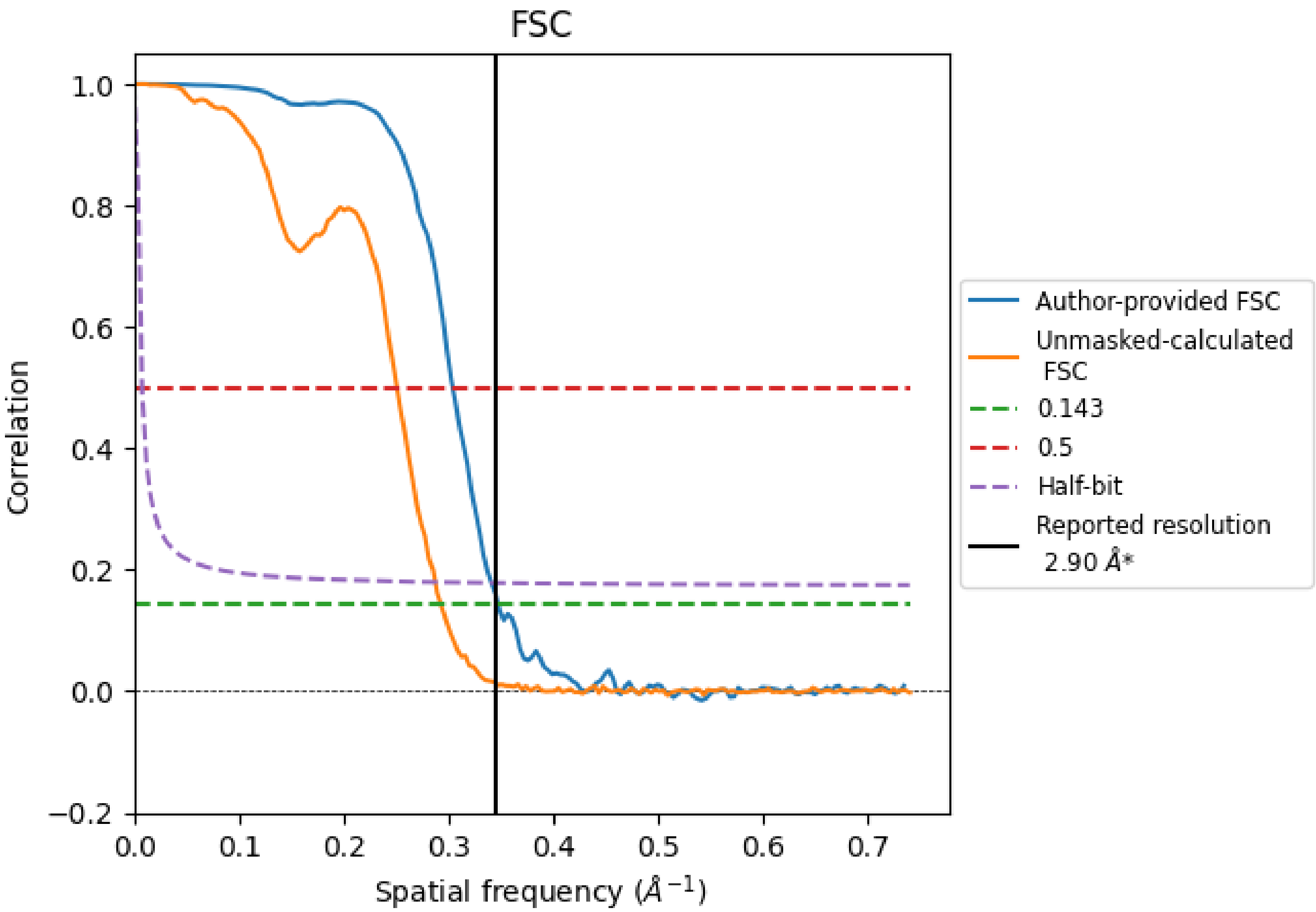


*Reported resolution corresponds to spatial frequency of 0.345 Å^{-1}

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 0.345 Å^{-1}

8.2 Resolution estimates ⓘ

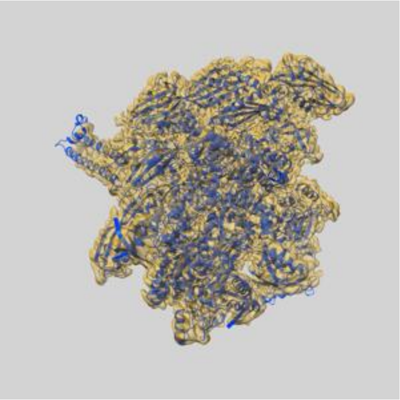
Resolution estimate (Å)	**Estimation criterion (FSC cut-off)**		
	0.143	0.5	Half-bit
Reported by author	2.90	-	-
Author-provided FSC curve	2.88	3.29	2.94
Unmasked-calculated*	3.42	3.99	3.48

*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 3.42 differs from the reported value 2.9 by more than 10 %

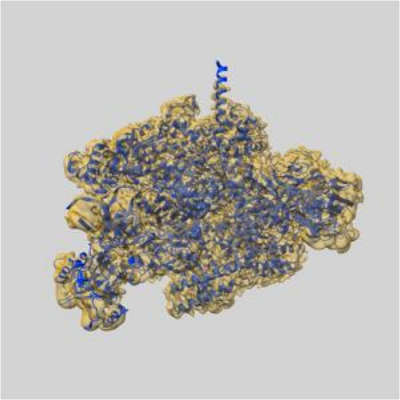
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-75280 and PDB model 10MB. Per-residue inclusion information can be found in section 3 on page 7.

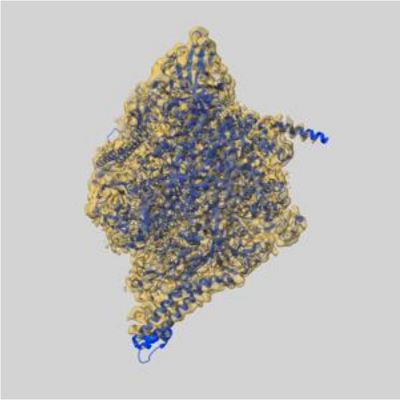
9.1 Map-model overlay (i)



X



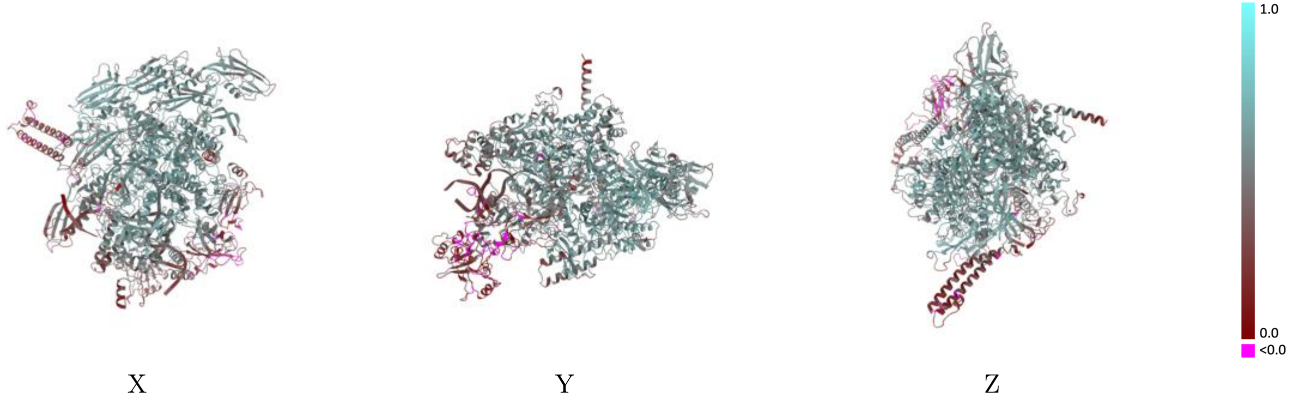
Y



Z

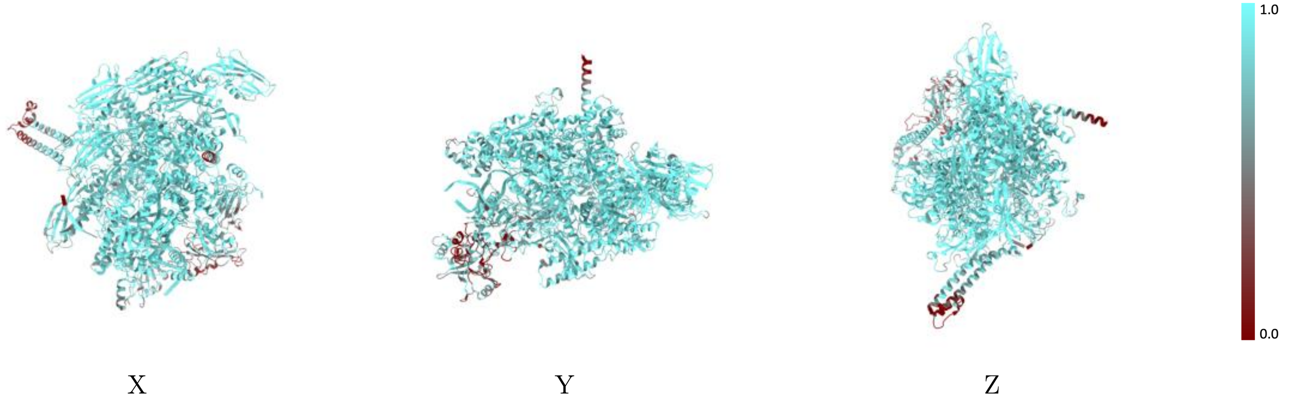
The images above show the 3D surface view of the map at the recommended contour level 0.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model



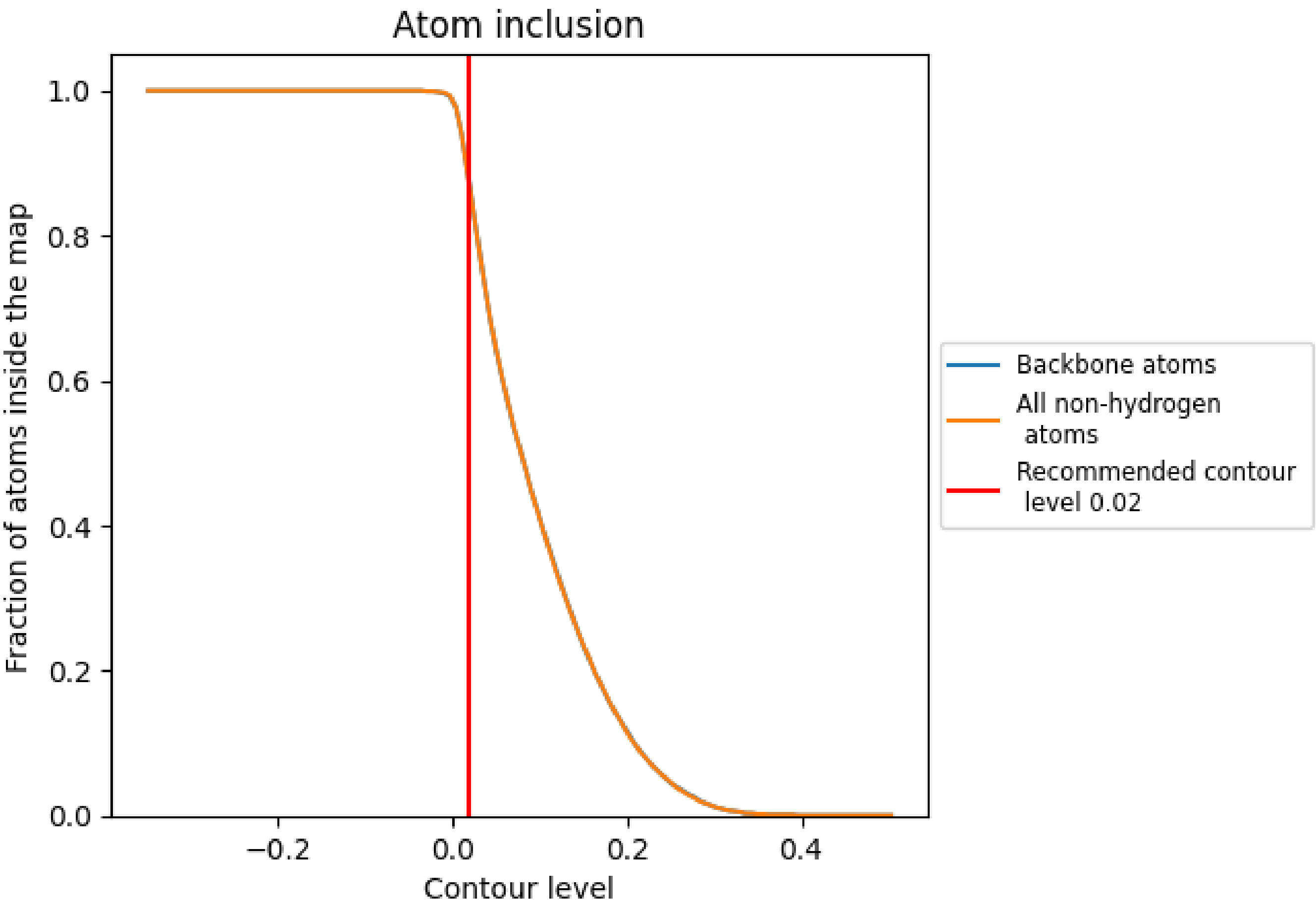
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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



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 ⓘ



At the recommended contour level, 87% 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 (0.02) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	■ 0.8680	■ 0.4930
A	■ 0.8300	■ 0.3030
B	■ 0.8680	■ 0.3950
G	■ 0.9490	■ 0.5800
H	■ 0.9140	■ 0.5270
I	■ 0.8820	■ 0.5090
J	■ 0.8470	■ 0.4710
K	■ 0.7400	■ 0.4790
R	■ 0.9630	■ 0.5540