wwPDB EM Validation Summary Report

Jul 14, 2024 – 08:17 pm BST

PDB ID	:	8AD1
EMDB ID	:	EMD-15357
Title	:	RNA polymerase at U-rich pause bound to RNA putL triple mutant - pause prone, closed clamp state
Authors	:	Dey, S.; Weixlbaumer, A.
Deposited on	:	2022-07-07
Resolution	:	4.10 Å(reported)
Based on initial model	:	6ALH

This is a wwPDB EM Validation Summary 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 (i) 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 (i)) were used in the production of this report:

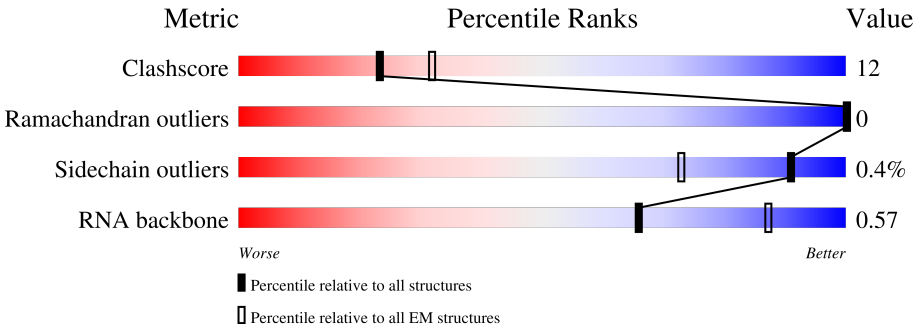
EMDB validation analysis	:	0.0.1.dev92
Mogul	:	1.8.4, CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.37.1

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 4.10 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
RNA backbone	4643	859

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	N	266	5% · 91%
2	R	93	· 9% 89%
3	T	266	5% 8% 86%
4	E	91	35% 54% 26% 20%
5	F	613	37% 23% 15% 61%
6	A	329	50% 18% 33%
6	B	329	47% 19% 34%

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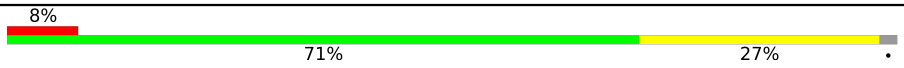
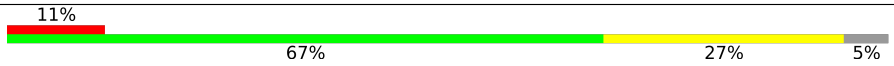
Mol	Chain	Length	Quality of chain
7	C	1342	
8	D	1406	

2 Entry composition (i)

There are 10 unique types of molecules in this entry. The entry contains 28169 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 Non-template DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
1	N	25	514	245	94	150	25	0	0

- Molecule 2 is a RNA chain called RNA putL triple mutant.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	R	10	209	93	30	76	10	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	14	C	G	engineered mutation	GB 1877730557
R	37	U	A	engineered mutation	GB 1877730557
R	40	C	G	engineered mutation	GB 1877730557

- Molecule 3 is a DNA chain called Template DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	T	36	739	351	141	211	36	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	E	73	582	355	111	115	1	0	0

- Molecule 5 is a protein called RNA polymerase sigma factor RpoD.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	F	237	1938	1223	347	356	12	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	571	HIS	TYR	conflict	UNP P00579

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

Mol	Chain	Residues	Atoms					AltConf	Trace
6	A	221	Total	C	N	O	S	0	0
			1706	1068	300	332	6		
6	B	218	Total	C	N	O	S	0	0
			1683	1051	297	329	6		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
7	C	1319	Total	C	N	O	S	0	0
			10407	6530	1814	2020	43		

- Molecule 8 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	D	1335	Total	C	N	O	S	0	0
			10388	6526	1854	1958	50		

- Molecule 9 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

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

- Molecule 10 is ZINC ION (three-letter code: ZN) (formula: Zn).

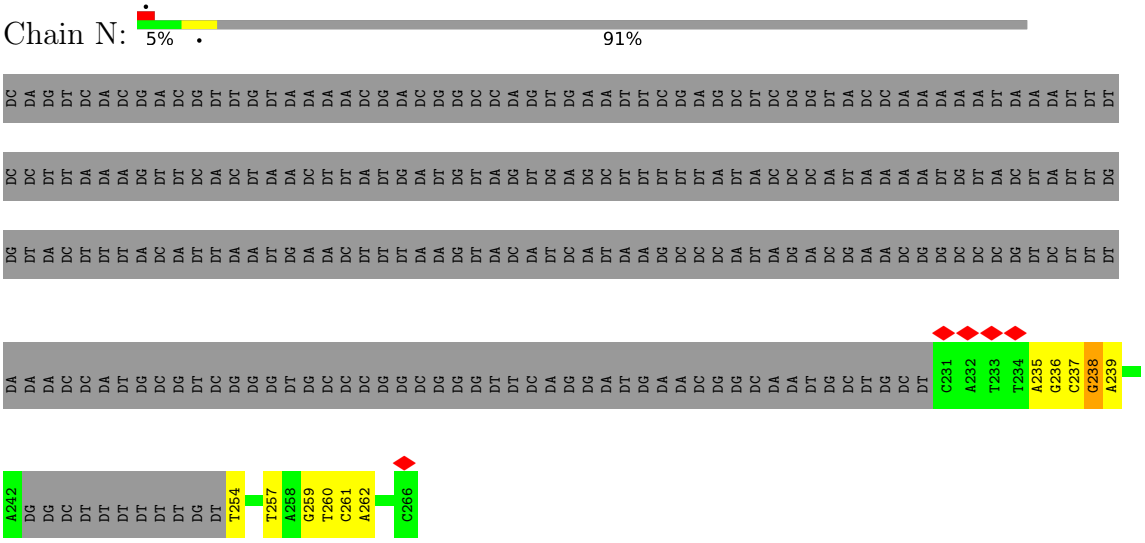
Mol	Chain	Residues	Atoms		AltConf
10	D	2	Total	Zn	0
			2	2	

3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

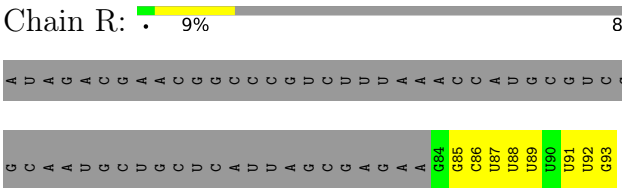
- Molecule 1: Non-template DNA

Chain N:



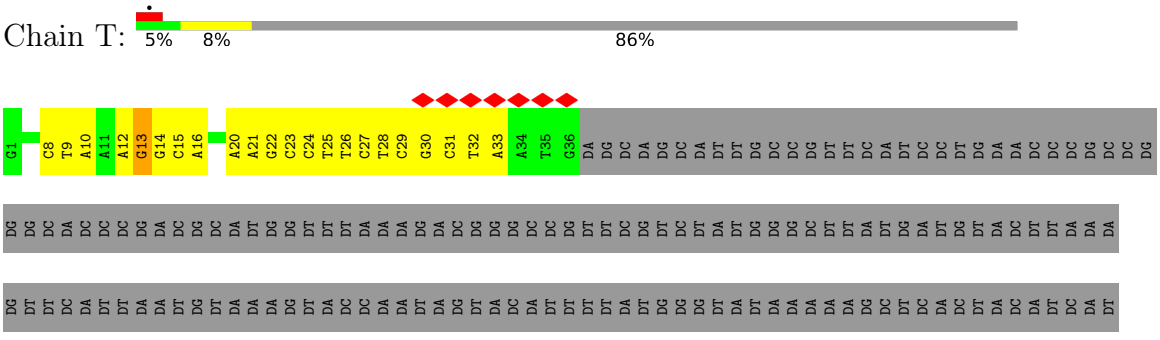
- Molecule 2: RNA putL triple mutant

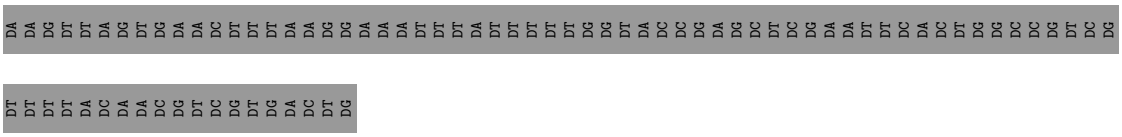
Chain R:



- Molecule 3: Template DNA

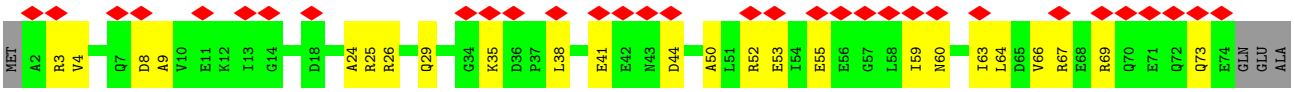
Chain T:





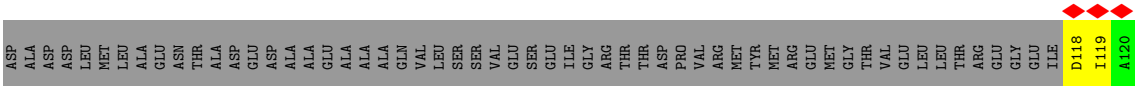
• Molecule 4: DNA-directed RNA polymerase subunit omega

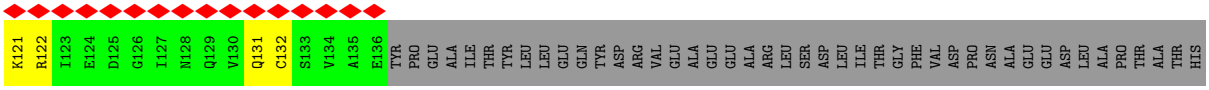
Chain E:

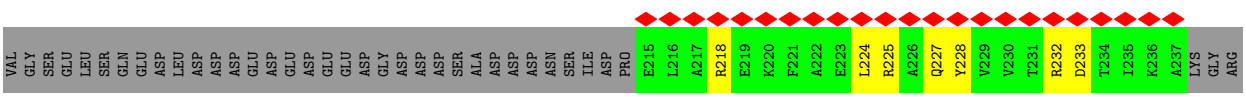


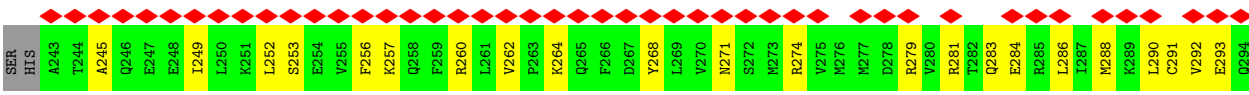
• Molecule 5: RNA polymerase sigma factor RpoD

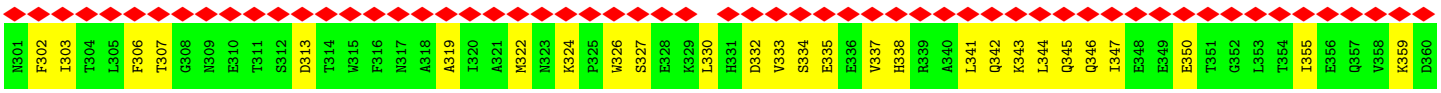
Chain F:

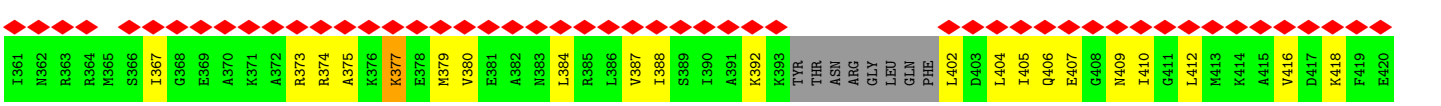


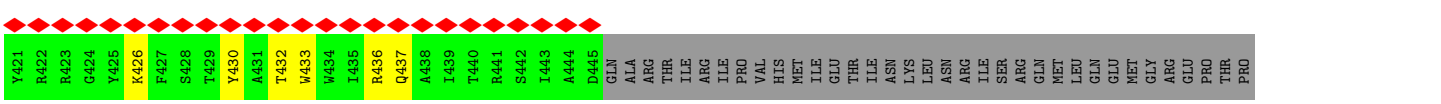


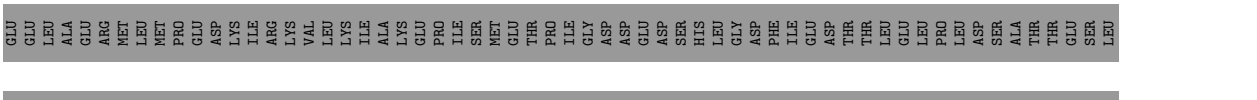






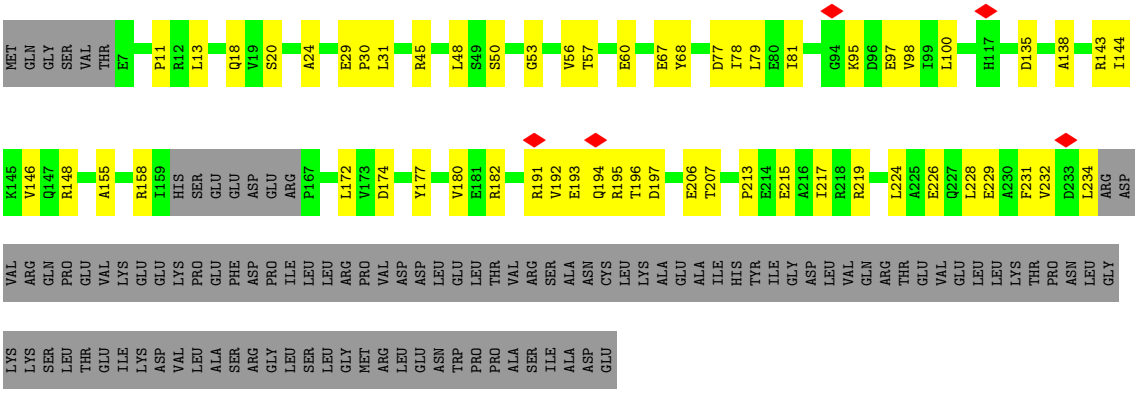






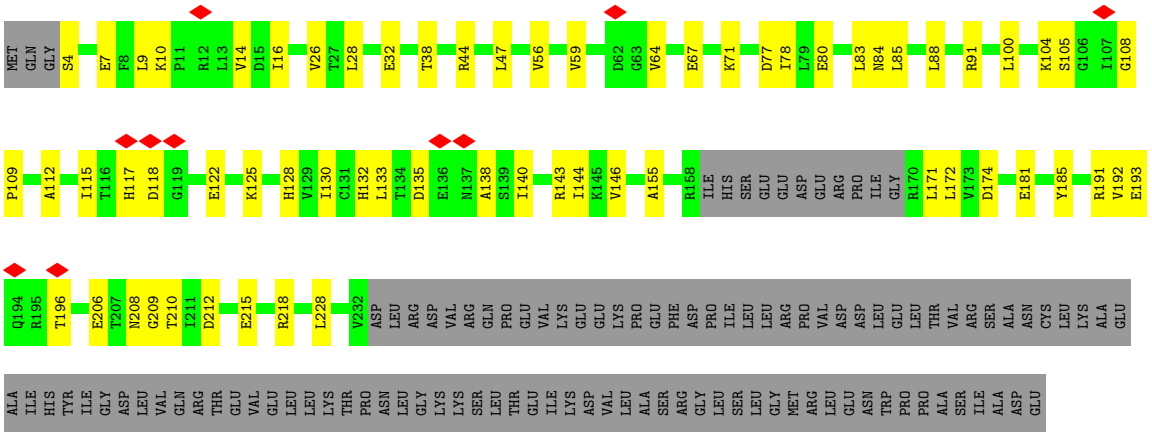
• Molecule 6: DNA-directed RNA polymerase subunit alpha

Chain A:



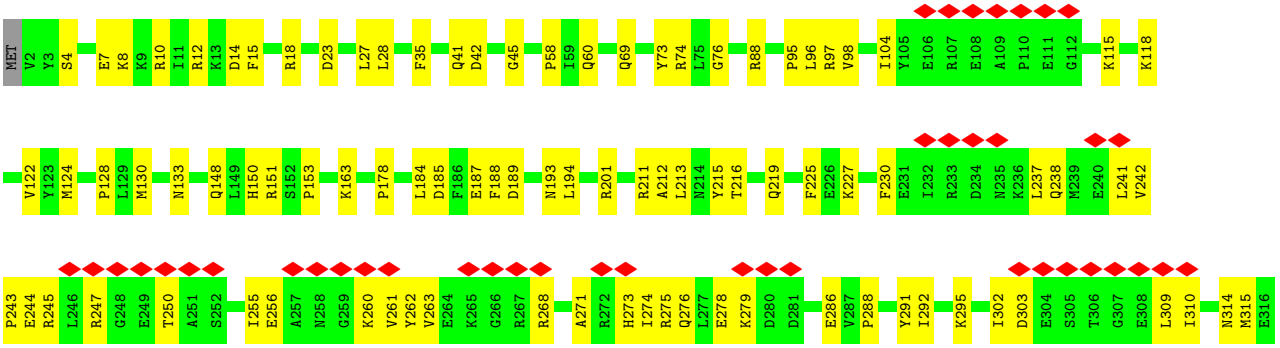
• Molecule 6: DNA-directed RNA polymerase subunit alpha

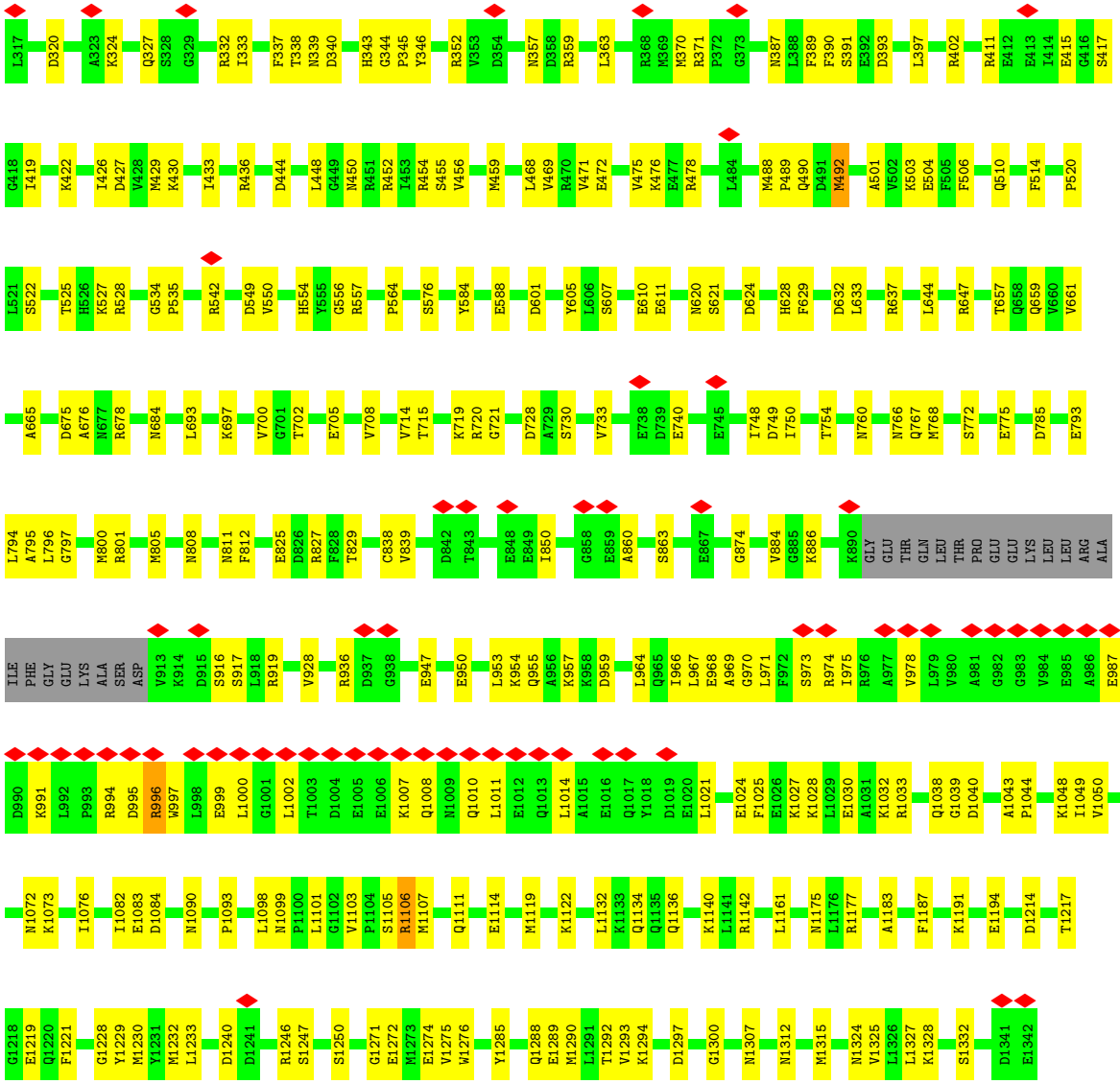
Chain B:



• Molecule 7: DNA-directed RNA polymerase subunit beta

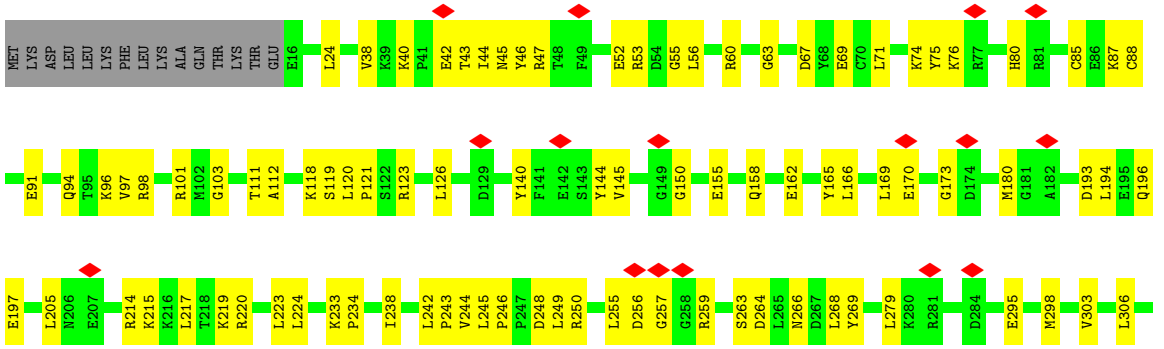
Chain C:

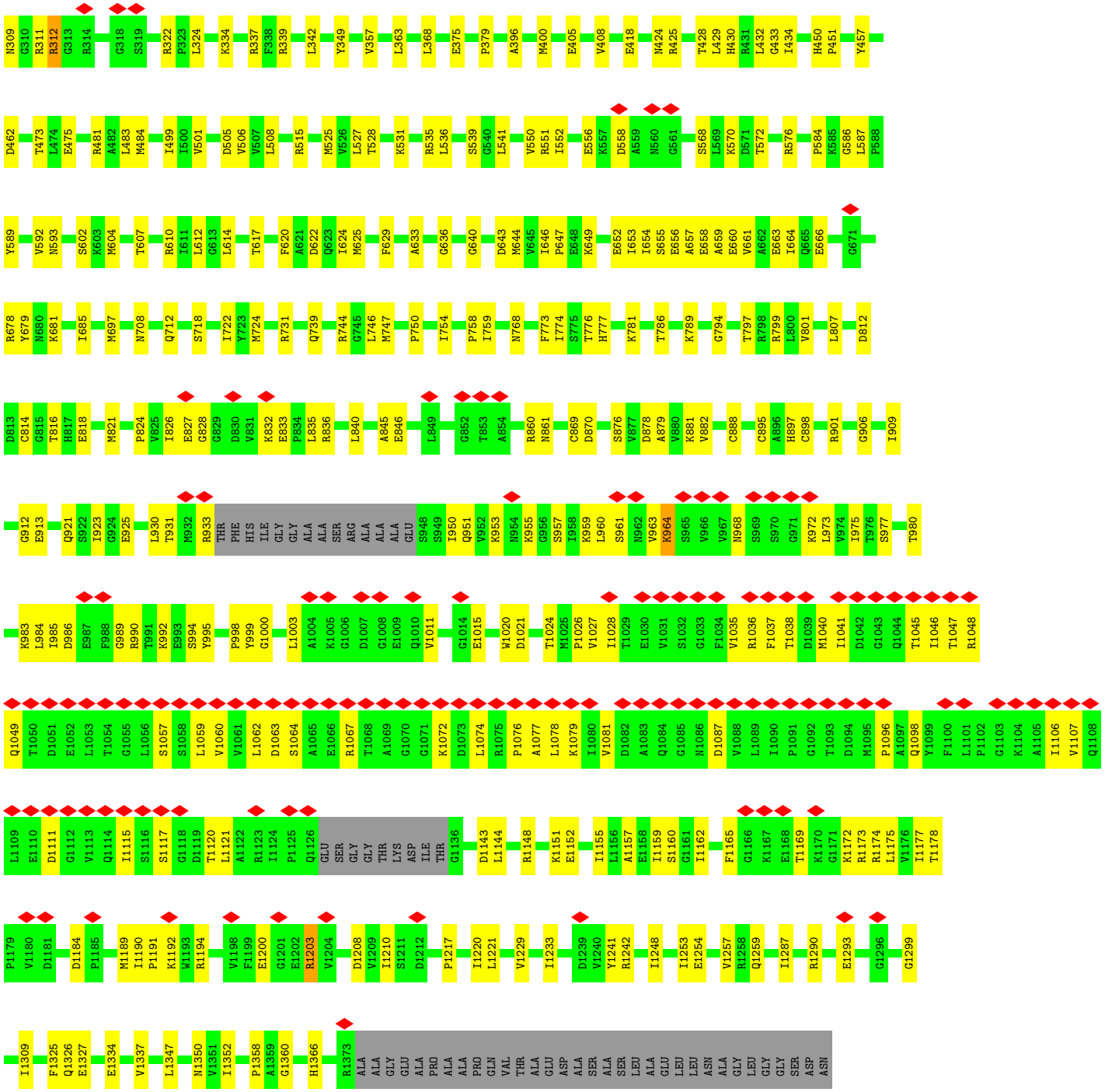




• Molecule 8: DNA-directed RNA polymerase subunit beta'

Chain D:




N309 G310 R311 R312 G313 R314 G318 S319 R322 F323 L324 K334 R337 F338 R339 L342 Y349 V357 L363 L368 E375 P379 A396 M400 E405 V408 E418 N424 R425 T428 L429 H430 R431 L432 G433 I434 H450 P451 Y457
D462 T473 L474 E475 R481 A482 L483 M484 I499 I500 V501 D505 V506 V507 L508 R515 M525 V526 L527 T528 K531 R535 L536 S539 G540 L541 V550 R551 I552 E556 K557 D558 A559 N560 G561 S568 L569 K570 D571 T572 R576 P584 K585 G586 L587 P588
Y589 V592 N593 S602 K603 M604 T607 R610 I611 L612 G613 L614 T617 F620 A621 D622 Q623 I624 M625 F629 A633 G636 G640 D643 M644 V645 I646 P647 E648 K649 E652 I653 I654 S655 E656 A657 E658 A659 E660 V661 A662 E663 I664 Q665 E666 G671
R678 Y679 N680 K681 I685 M697 N708 Q712 S718 I722 Y723 M724 R731 Q739 R744 G745 L746 M747 P750 I754 P758 I759 N768 F773 I774 S775 T776 H777 K781 T786 K789 G794 T797 R798 R799 L800 V801 L807 D812
D813 C814 G815 T816 H817 E818 M821 P824 V825 I826 E827 G828 G829 D830 V831 K832 E833 P834 L835 R836 L840 A845 E846 L849 G852 T853 A854 R860 N861 C869 D870 S876 V877 D878 A879 V880 K881 V882 C888 C895 A896 H897 C898 R901 G906 I909
G912 E913 Q921 S922 I923 G924 E925 L930 T931 M932 R933 THR PHE HIS ILE GLY GLY ALA ALA SER ARG ALA ALA ALA GLU S948 S949 I950 Q951 V952 K953 N954 K955 G956 S957 I958 K959 L960 S961 N962 V963 K964 S965 V966 V967 N968 S969 S970 G971 K972 L973 V974 I975 T976 S977 T980
K983 L984 I985 D986 E987 F988 G989 R990 T991 K992 E993 S994 Y995 P998 Y999 G1000 L1003 A1004 K1005 G1006 D1007 G1008 E1009 Q1010 V1011 G1014 E1015 W1020 D1021 T1024 M1025 P1026 V1027 I1028 T1029 E1030 V1031 S1032 G1033 F1034 V1035 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 G1071 K1072 D1073 L1074 R1075 P1076 A1077 L1078 K1079 I1080 V1081 D1082 A1083 Q1084 G1085 N1086 D1087 V1088 L1089 I1090 P1091 G1092 T1093 D1094 M1095 P1096 A1097 Q1098 Y1099 F1100 L1101 P1102 G1103 K1104 A1105 I1106 V1107 Q1108
L1109 E1110 D1111 G1112 V1113 Q1114 I1115 S1116 S1117 G1118 D1119 T1120 L1121 A1122 R1123 I1124 P1125 Q1126 GLU SER GLY GLY THR LYS ASP ILE THR G1136 D1143 L1144 R1148 K1151 E1152 I1155 L1156 A1157 E1158 I1159 S1160 G1161 I1162 F1165 G1166 K1167 E1168 T1169 K1170 G1171 K1172 R1173 R1174 L1175 V1176 I1177 T1178
P1179 V1180 D1181 D1184 P1185 M1189 I1190 P1191 K1192 W1193 R1194 V1198 F1199 E1200 G1201 E1202 R1203 V1204 D1208 V1209 I1210 S1211 D1212 P1217 I1220 L1221 V1229 I1233 D1239 V1240 Y1241 R1242 I1248 I1253 E1254 V1257 R1258 Q1259 I1287 R1290 E1293 G1296 G1299
I1309 F1325 Q1326 E1327 E1334 V1337 L1347 N1350 V1351 I1352 P1358 A1359 G1360 H1366 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

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	93293	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 ($e^-/Å^2$)	52	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.436	Depositor
Minimum map value	-0.166	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.019	Depositor
Recommended contour level	0.118	Depositor
Map size (Å)	310.32, 310.32, 310.32	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.86200005, 0.86200005, 0.86200005	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, IGU, 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	N	0.52	0/575	0.95	1/883 (0.1%)
2	R	0.26	0/231	0.89	0/357
3	T	0.52	0/779	0.86	0/1196
4	E	0.25	0/584	0.58	0/786
5	F	0.24	0/1961	0.50	0/2625
6	A	0.26	0/1726	0.55	1/2338 (0.0%)
6	B	0.25	0/1702	0.51	0/2306
7	C	0.26	0/10573	0.51	0/14265
8	D	0.25	0/10545	0.51	0/14236
All	All	0.27	0/28676	0.55	2/38992 (0.0%)

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	N	238	DG	O4'-C4'-C3'	-5.13	102.45	104.50
6	A	50	SER	C-N-CA	5.11	134.47	121.70

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	N	514	0	284	7	0
2	R	209	0	104	7	0
3	T	739	0	404	14	0
4	E	582	0	593	18	0
5	F	1938	0	1992	76	0
6	A	1706	0	1746	41	0
6	B	1683	0	1719	41	0
7	C	10407	0	10420	253	0
8	D	10388	0	10611	271	0
9	D	1	0	0	0	0
10	D	2	0	0	0	0
All	All	28169	0	27873	690	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 12.

The worst 5 of 690 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)
8:D:888:CYS:HB2	8:D:898:CYS:SG	2.03	0.97
8:D:429:LEU:O	8:D:921:GLN:NE2	1.99	0.96
8:D:309:ASN:ND2	8:D:324:LEU:O	2.16	0.79
8:D:268:LEU:HD23	8:D:306:LEU:HA	1.64	0.79
7:C:968:GLU:HA	7:C:971:LEU:HG	1.67	0.76

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	
4	E	71/91 (78%)	69 (97%)	2 (3%)	0	100	100
5	F	229/613 (37%)	210 (92%)	19 (8%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
6	A	217/329 (66%)	206 (95%)	11 (5%)	0	100	100
6	B	214/329 (65%)	208 (97%)	6 (3%)	0	100	100
7	C	1315/1342 (98%)	1264 (96%)	51 (4%)	0	100	100
8	D	1329/1406 (94%)	1276 (96%)	53 (4%)	0	100	100
All	All	3375/4110 (82%)	3233 (96%)	142 (4%)	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	
4	E	63/75 (84%)	63 (100%)	0	100	100
5	F	209/540 (39%)	206 (99%)	3 (1%)	67	80
6	A	189/286 (66%)	189 (100%)	0	100	100
6	B	187/286 (65%)	186 (100%)	1 (0%)	88	93
7	C	1138/1157 (98%)	1134 (100%)	4 (0%)	91	94
8	D	1120/1167 (96%)	1116 (100%)	4 (0%)	91	94
All	All	2906/3511 (83%)	2894 (100%)	12 (0%)	91	94

5 of 12 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
7	C	1106	ARG
8	D	87	LYS
8	D	1203	ARG
8	D	312	ARG
6	B	143	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 10 such sidechains are listed below:

Mol	Chain	Res	Type
8	D	196	GLN
8	D	200	GLN
8	D	921	GLN
5	F	406	GLN
6	A	18	GLN

5.3.3 RNA (i)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
2	R	9/93 (9%)	1 (11%)	0

All (1) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
2	R	85	G

There are no RNA pucker outliers to report.

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

2 non-standard protein/DNA/RNA residues are modelled in this entry.

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

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\#\|Z\| > 2$	Counts	RMSZ	$\#\|Z\| > 2$
3	IGU	T	14	3	21,24,25	1.32	4 (19%)	30,35,38	2.03	10 (33%)
3	IGU	T	13	1,3	21,24,25	1.25	3 (14%)	30,35,38	1.72	6 (20%)

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

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	IGU	T	14	3	-	0/7/21/22	0/3/3/3
3	IGU	T	13	1,3	-	0/7/21/22	0/3/3/3

The worst 5 of 7 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	T	14	IGU	C5-C6	3.35	1.48	1.40
3	T	13	IGU	C5-C6	3.01	1.47	1.40
3	T	14	IGU	O3'-C3'	2.52	1.48	1.43
3	T	13	IGU	C5-N7	-2.40	1.34	1.39
3	T	13	IGU	C4-N9	-2.40	1.31	1.38

The worst 5 of 16 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	T	13	IGU	C6-C5-N7	4.95	136.31	130.21
3	T	14	IGU	C6-C5-N7	4.79	136.11	130.21
3	T	14	IGU	O4'-C1'-N9	4.09	115.17	107.86
3	T	14	IGU	C2'-C1'-N9	-4.02	104.52	113.77
3	T	14	IGU	C5-C4-N3	-3.48	119.62	127.52

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	T	13	IGU	1	0

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry (i)

Of 3 ligands modelled in this entry, 3 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.

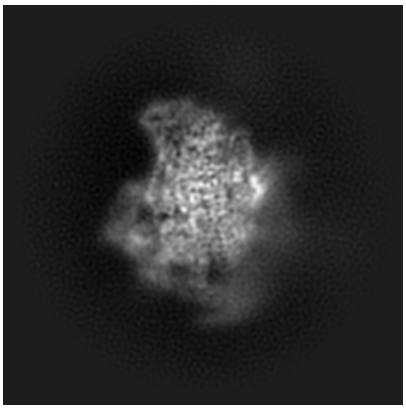
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-15357. These allow visual inspection of the internal detail of the map and identification of artifacts.

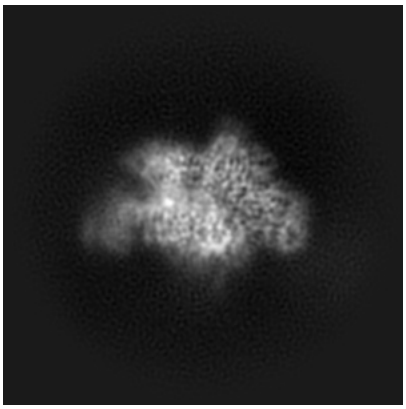
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

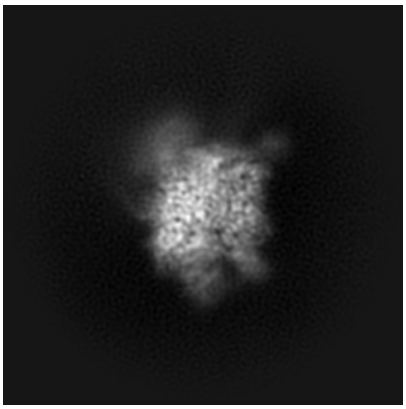
6.1.1 Primary map



X

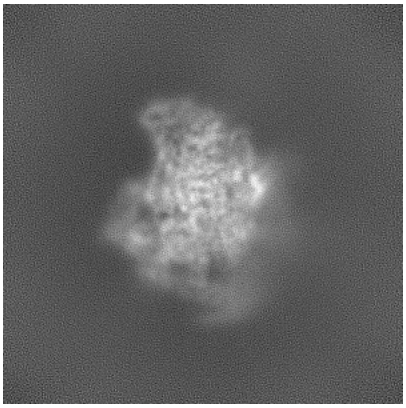


Y

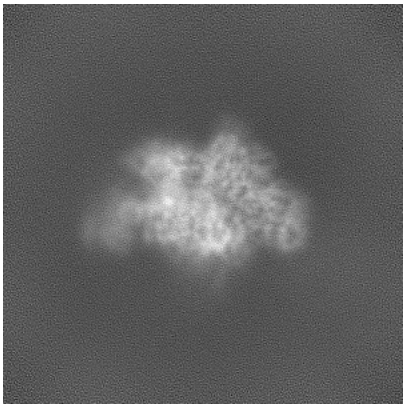


Z

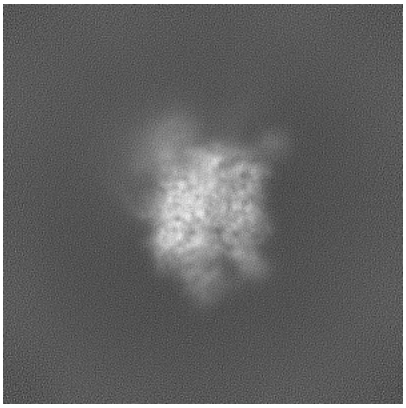
6.1.2 Raw map



X



Y

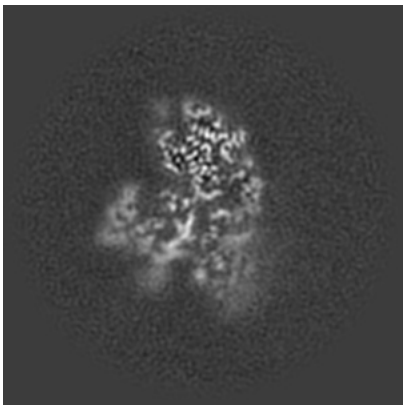


Z

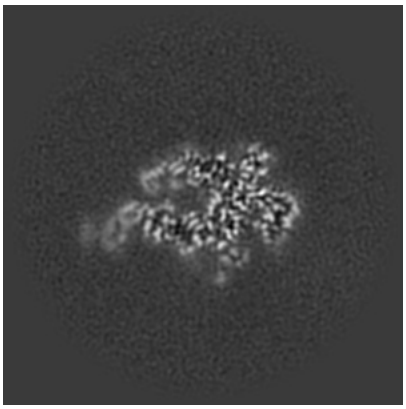
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

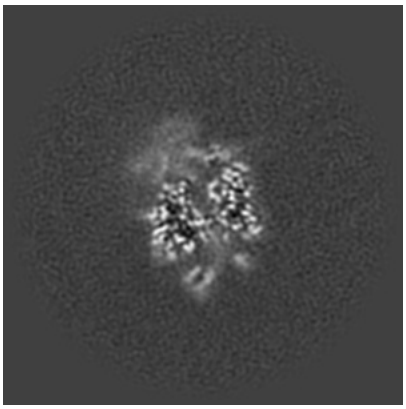
6.2.1 Primary map



X Index: 180

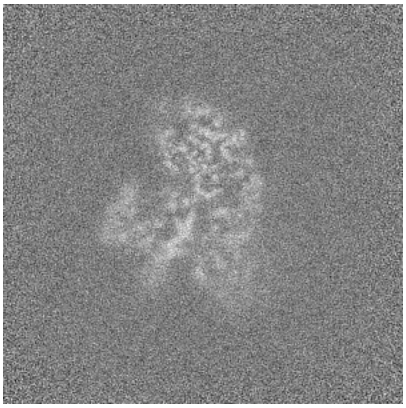


Y Index: 180

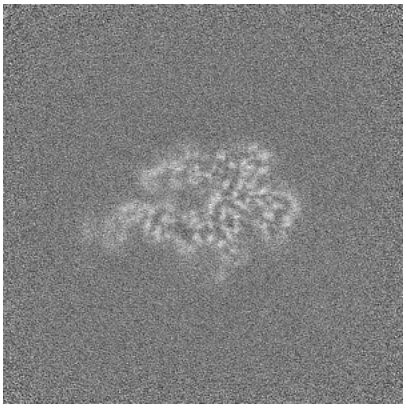


Z Index: 180

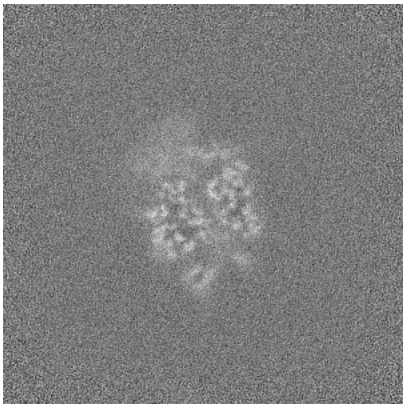
6.2.2 Raw map



X Index: 180



Y Index: 180

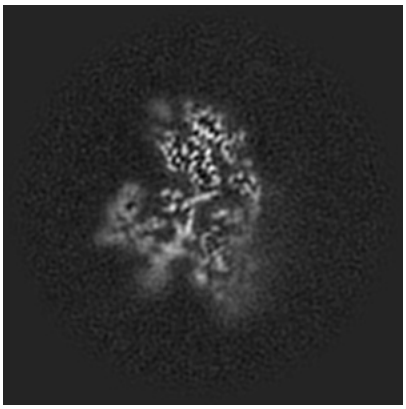


Z Index: 180

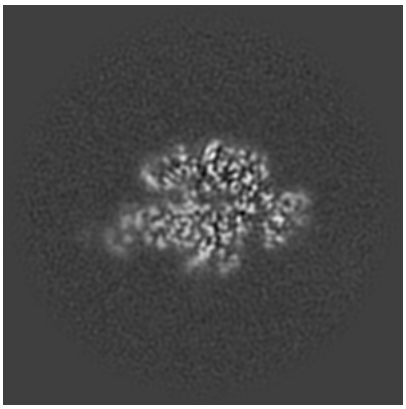
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

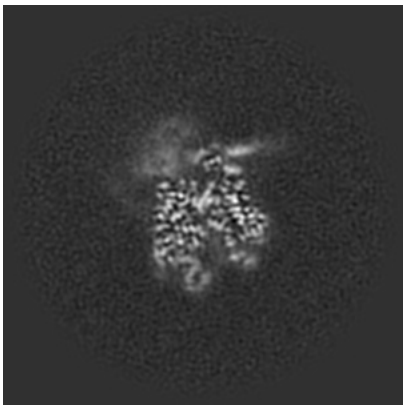
6.3.1 Primary map



X Index: 178

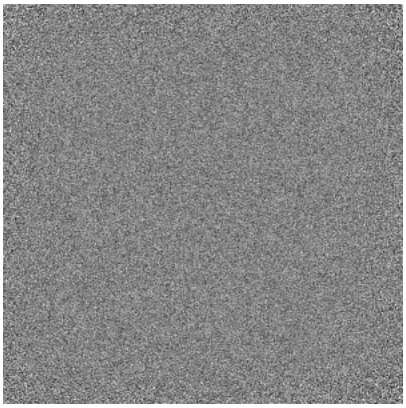


Y Index: 170

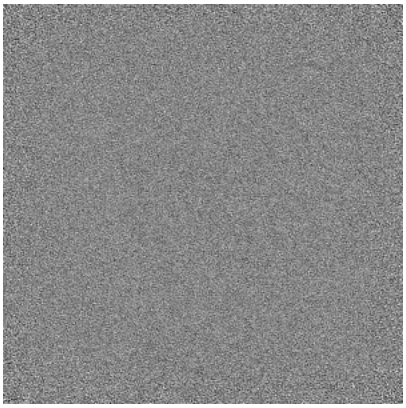


Z Index: 187

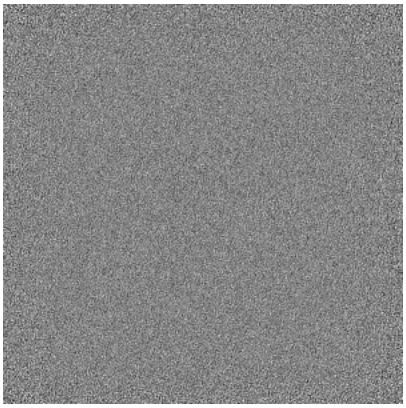
6.3.2 Raw map



X Index: 0



Y Index: 0

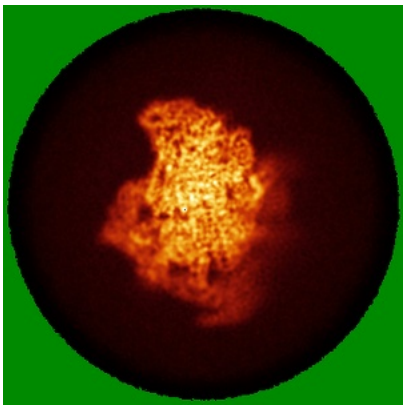


Z Index: 0

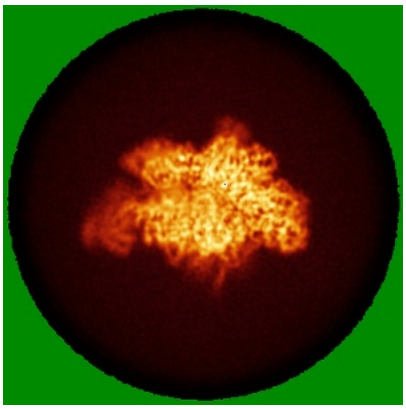
The images above show the largest variance slices of the map in three orthogonal directions.

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

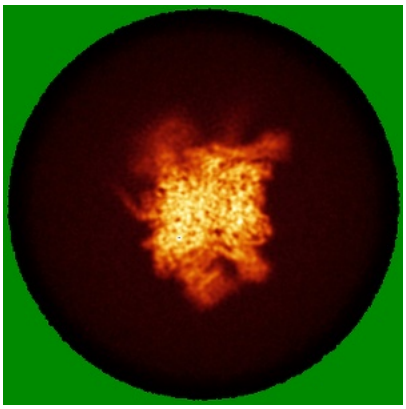
6.4.1 Primary map



X

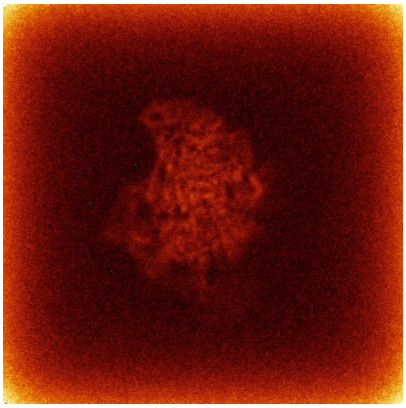


Y

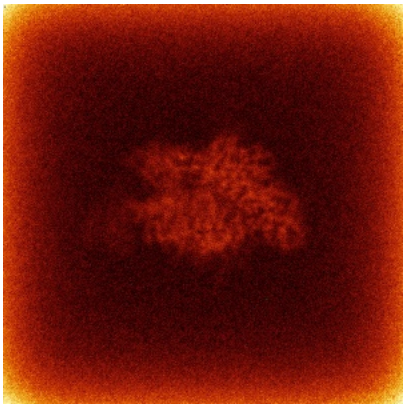


Z

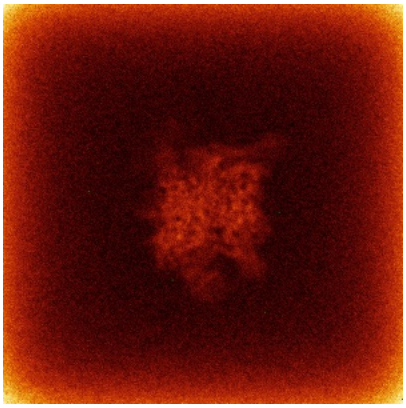
6.4.2 Raw map



X



Y



Z

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

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.118. 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.

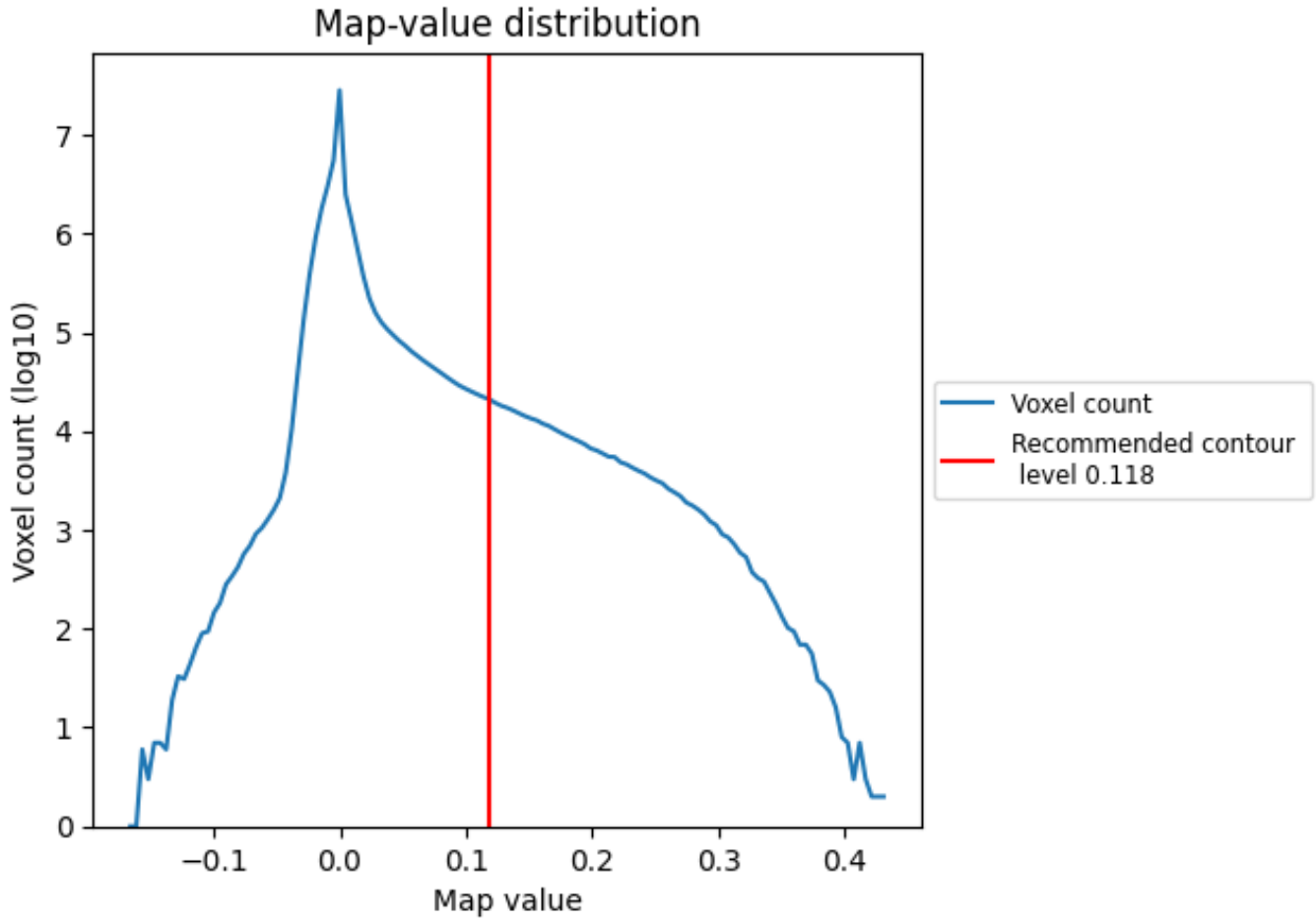
6.6 Mask visualisation (i)

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

7 Map analysis

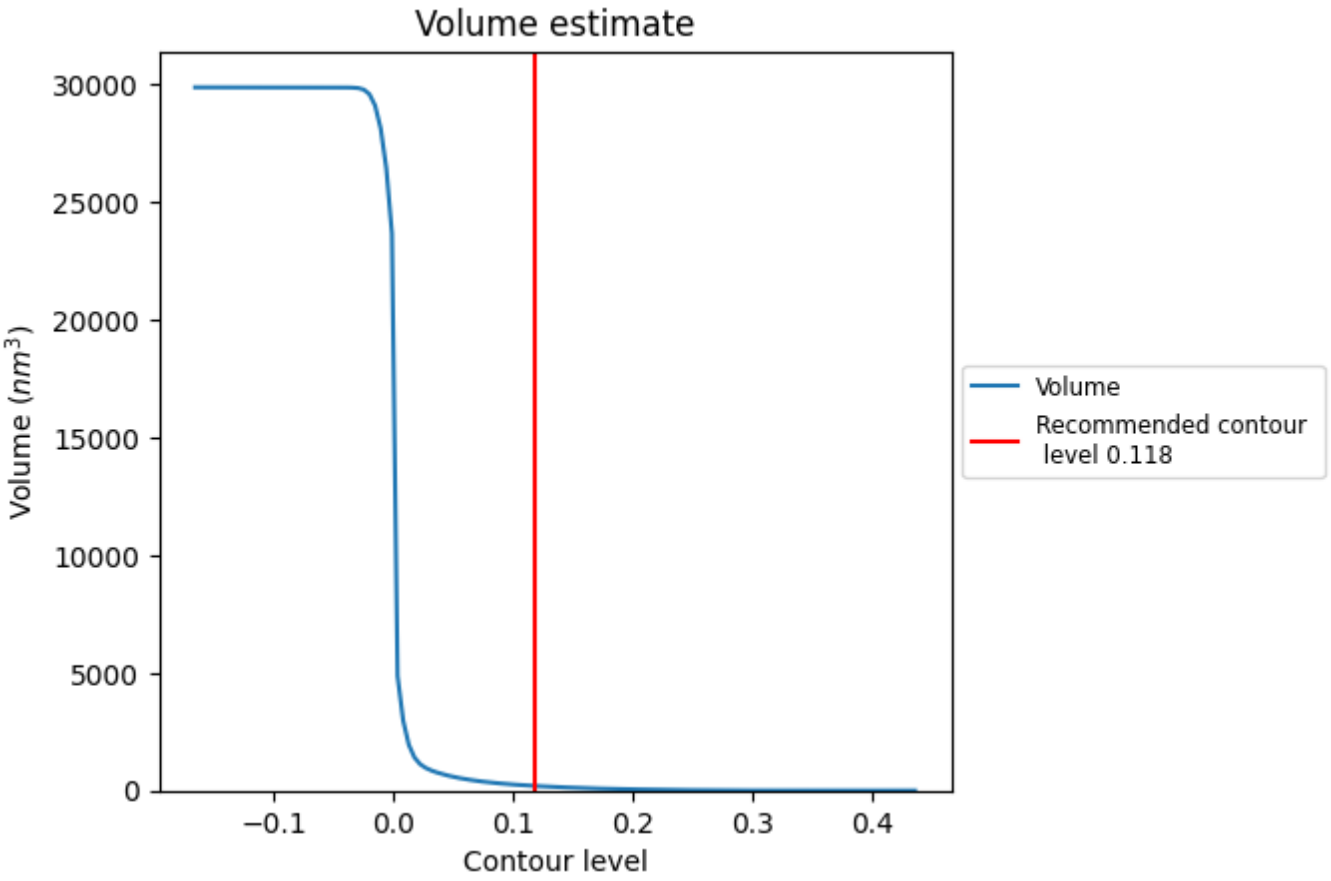
This section contains the results of statistical analysis of the map.

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.

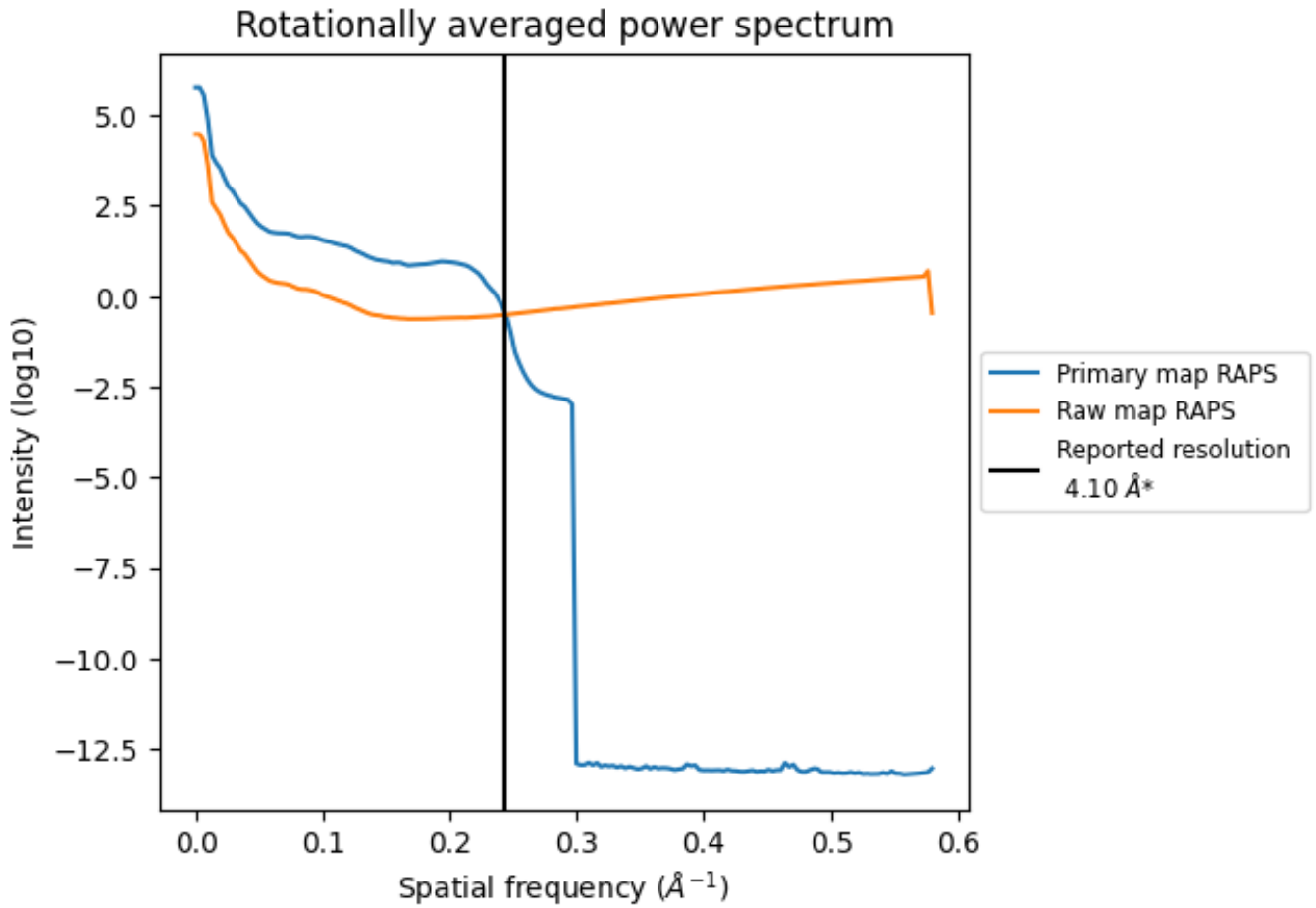
7.2 Volume estimate (i)



The volume at the recommended contour level is 197 nm^3; this corresponds to an approximate mass of 178 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)

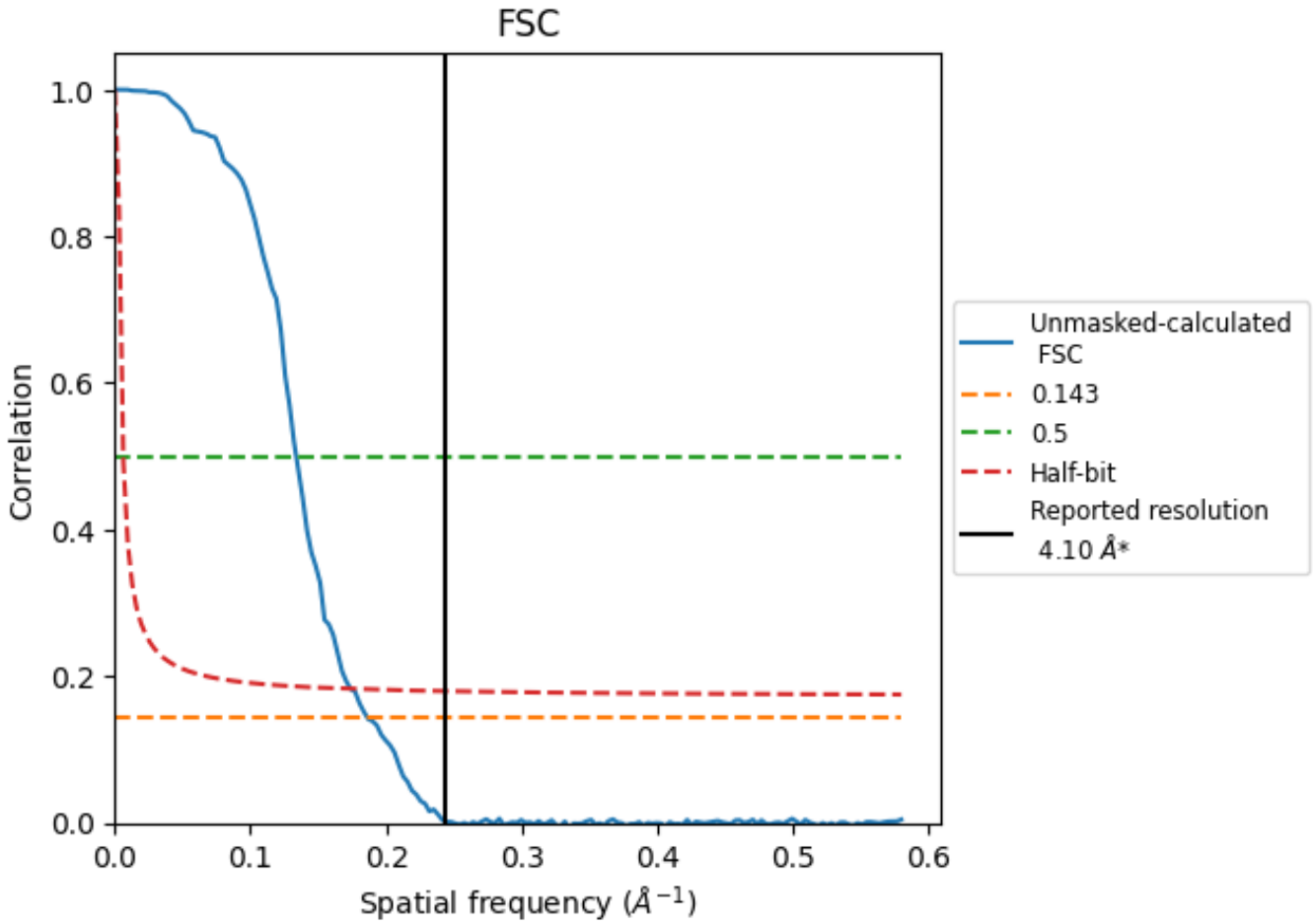


*Reported resolution corresponds to spatial frequency of 0.244 $Å^{-1}$

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 0.244 Å^{-1}

8.2 Resolution estimates (i)

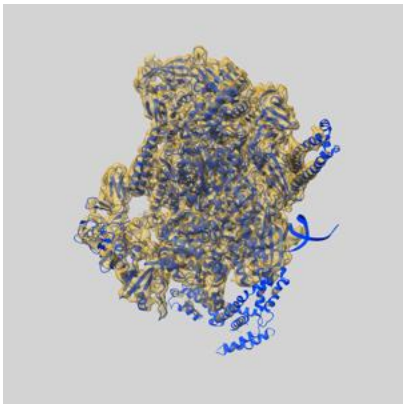
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.10	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	5.36	7.47	5.75

*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 5.36 differs from the reported value 4.1 by more than 10 %

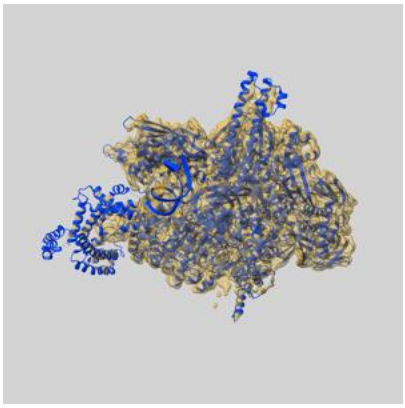
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-15357 and PDB model 8AD1. Per-residue inclusion information can be found in section 3 on page 6.

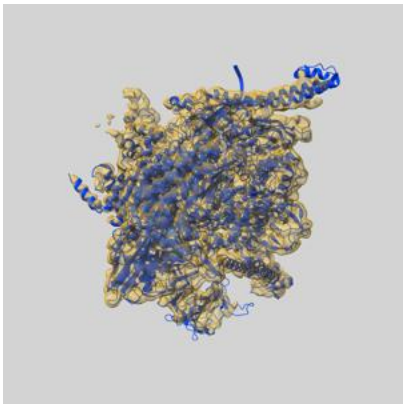
9.1 Map-model overlay



X



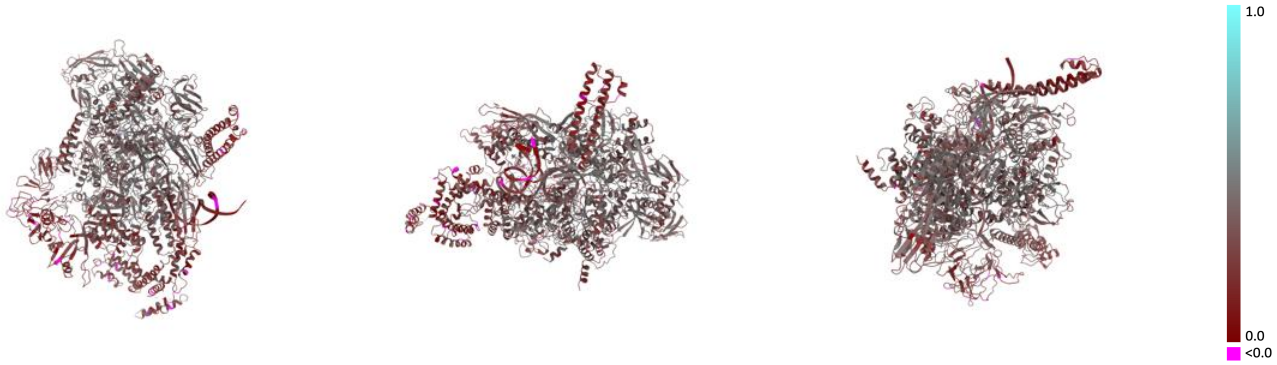
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.118 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.

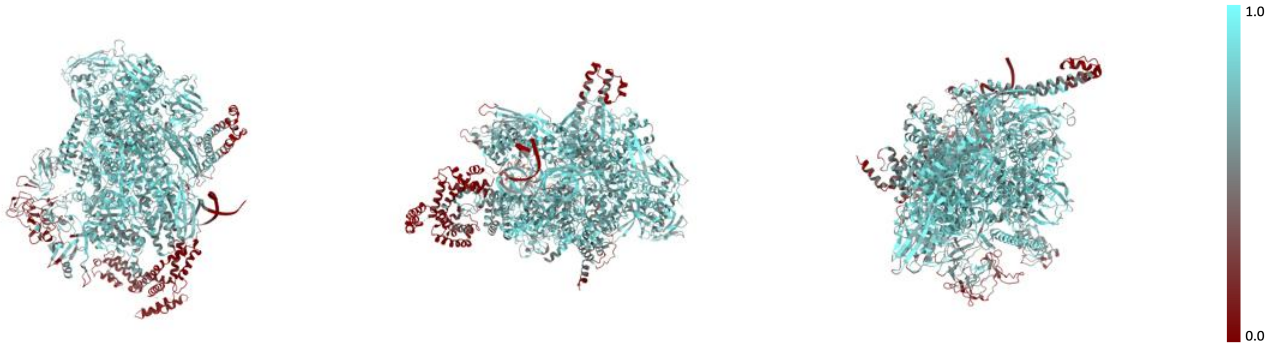
9.2 Q-score mapped to coordinate model (i)



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.

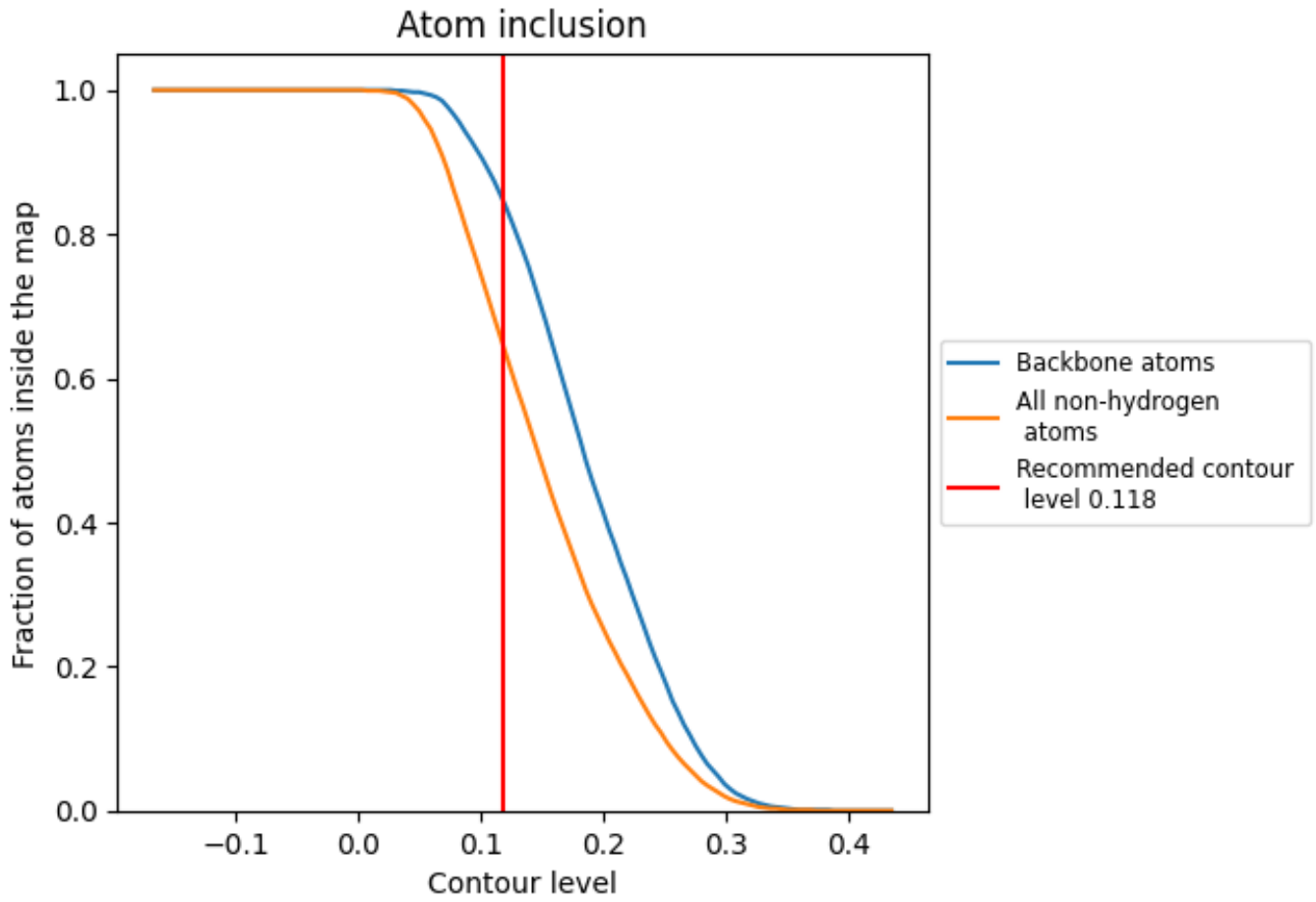
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.118).

9.4 Atom inclusion (i)



At the recommended contour level, 85% of all backbone atoms, 65% 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 (0.118) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.6490	0.3370
A	0.7510	0.3920
B	0.7290	0.3720
C	0.7020	0.3550
D	0.6800	0.3420
E	0.4010	0.3150
F	0.0680	0.1950
N	0.6070	0.2110
R	0.9040	0.3780
T	0.7020	0.2590