



# wwPDB EM Validation Summary Report ⓘ

May 19, 2024 – 05:46 PM EDT

PDB ID : 7MKO  
EMDB ID : EMD-23901  
Title : Escherichia coli RNA polymerase elongation complex  
Authors : Qayyum, M.Z.; Murakami, K.S.  
Deposited on : 2021-04-26  
Resolution : 3.15 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto: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>.

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

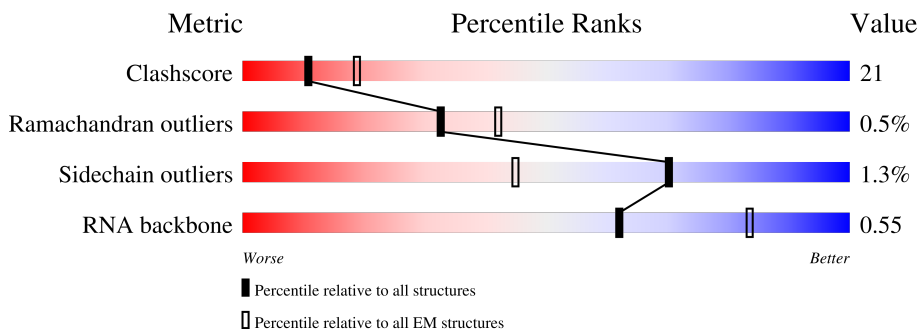
EMDB validation analysis : 0.0.1.dev92  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.36.2

# 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 3.15 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  $\geq 3$ , 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  $\leq 5\%$ . 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	237	6% (poor fit), 63% (0 outliers), 34% (1 outlier), . (2 outliers), . (3+ outliers)
1	B	237	8% (poor fit), 56% (0 outliers), 39% (1 outlier), . (2 outliers), . (3+ outliers)
2	C	1340	9% (poor fit), 56% (0 outliers), 42% (1 outlier), .. (2 outliers), .. (3+ outliers)
3	D	1363	13% (poor fit), 56% (0 outliers), 41% (1 outlier), .. (2 outliers), .. (3+ outliers)
4	E	91	68% (poor fit), 42% (0 outliers), 34% (1 outlier), 24% (not modelled)
5	N	29	. (poor fit), 48% (0 outliers), 28% (1 outlier), 24% (not modelled)
6	R	11	64% (0 outliers), 18% (1 outlier), 18% (2 outliers)

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Mol	Chain	Length	Quality of chain
7	T	29	 <p>A horizontal bar chart representing the quality of chain. The bar is divided into three segments: a red segment on the left labeled '14%', a green segment in the middle labeled '48%', and a yellow segment on the right labeled '48%'. A small black dot is visible at the far right end of the bar.</p>

## 2 Entry composition [i](#)

There are 10 unique types of molecules in this entry. The entry contains 26269 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 subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	231	Total	C	N	O	S	0	0
			1794	1117	318	353	6		
1	B	230	Total	C	N	O	S	0	0
			1786	1112	317	351	6		

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	1320	Total	C	N	O	S	0	0
			10414	6532	1815	2024	43		

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	D	1344	Total	C	N	O	S	0	0
			10419	6546	1856	1967	50		

- 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	69	Total	C	N	O	S	0	0
			546	335	105	105	1		

- Molecule 5 is a DNA chain called DNA (29-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	N	22	Total	C	N	O	P	0	0
			451	214	89	127	21		

- Molecule 6 is a RNA chain called RNA (20-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
6	R	11	Total	C	N	O	P	0	0
			244	108	50	75	11		

- Molecule 7 is a DNA chain called DNA (29-MER).

Mol	Chain	Residues	Atoms					AltConf	Trace
7	T	29	Total	C	N	O	P	0	0
			583	279	99	177	28		

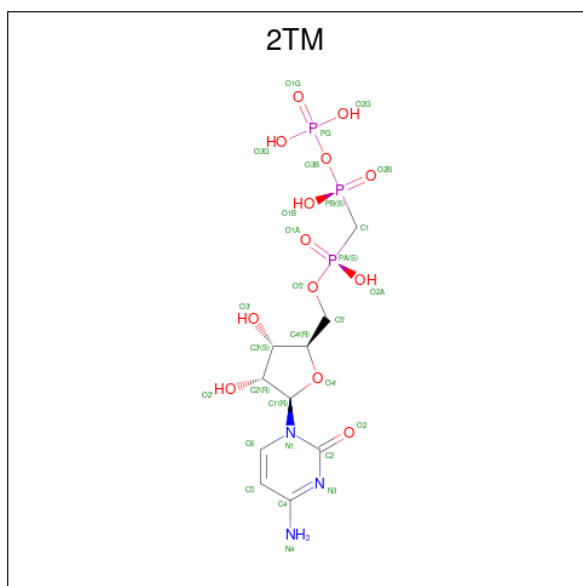
- Molecule 8 is MAGNESIUM ION (three-letter code: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

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

- Molecule 9 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

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

- Molecule 10 is 5'-O-[(S)-hydroxy{[(S)-hydroxy(phosphonooxy)phosphoryl]methyl}phosphoryl]cytidine (three-letter code: 2TM) (formula: C<sub>10</sub>H<sub>18</sub>N<sub>3</sub>O<sub>13</sub>P<sub>3</sub>) (labeled as "Ligand of Interest" by depositor).

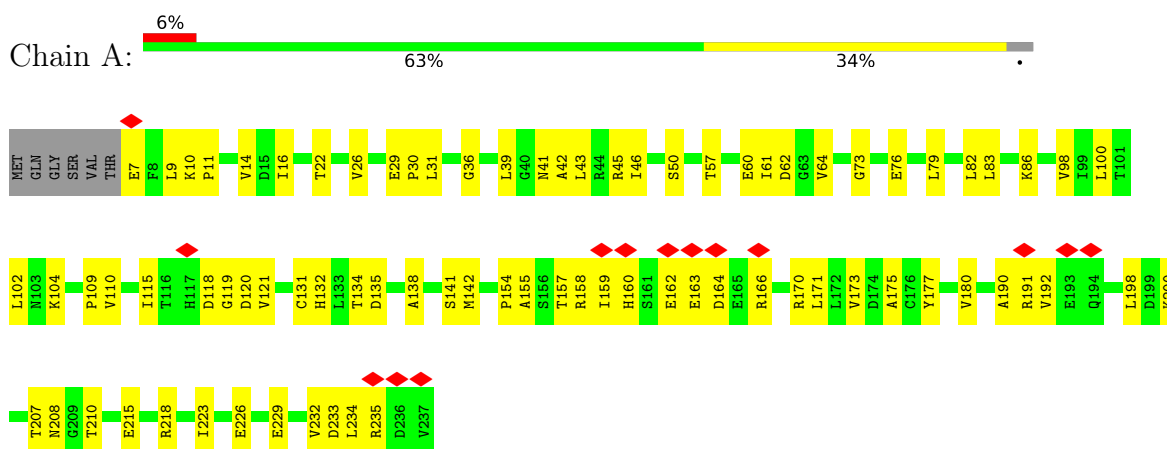


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
10	D	1	29	10	3	13	3	0

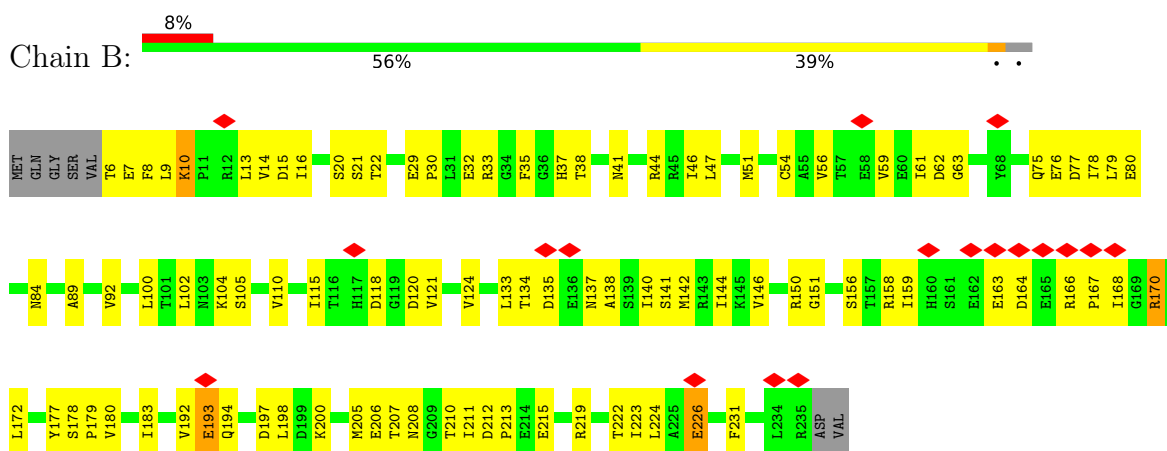
### 3 Residue-property plots [i](#)

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.

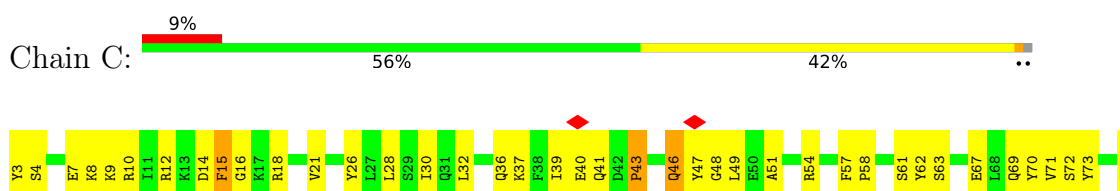
- Molecule 1: DNA-directed RNA polymerase subunit alpha



- Molecule 1: DNA-directed RNA polymerase subunit alpha

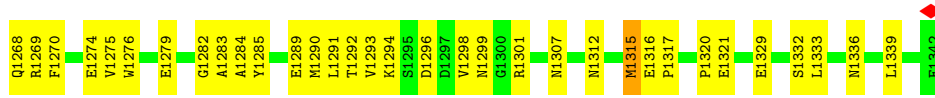


- Molecule 2: DNA-directed RNA polymerase subunit beta

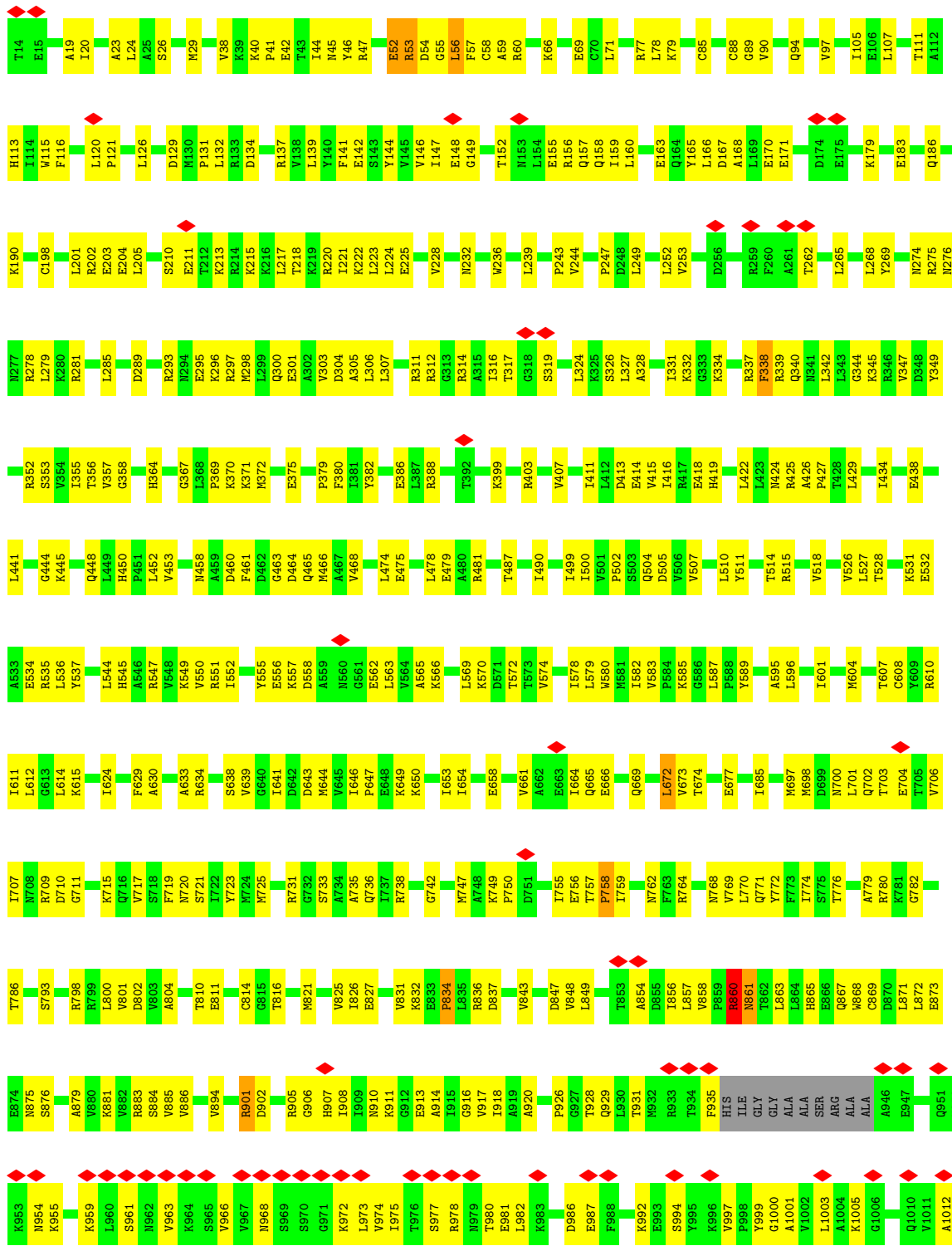


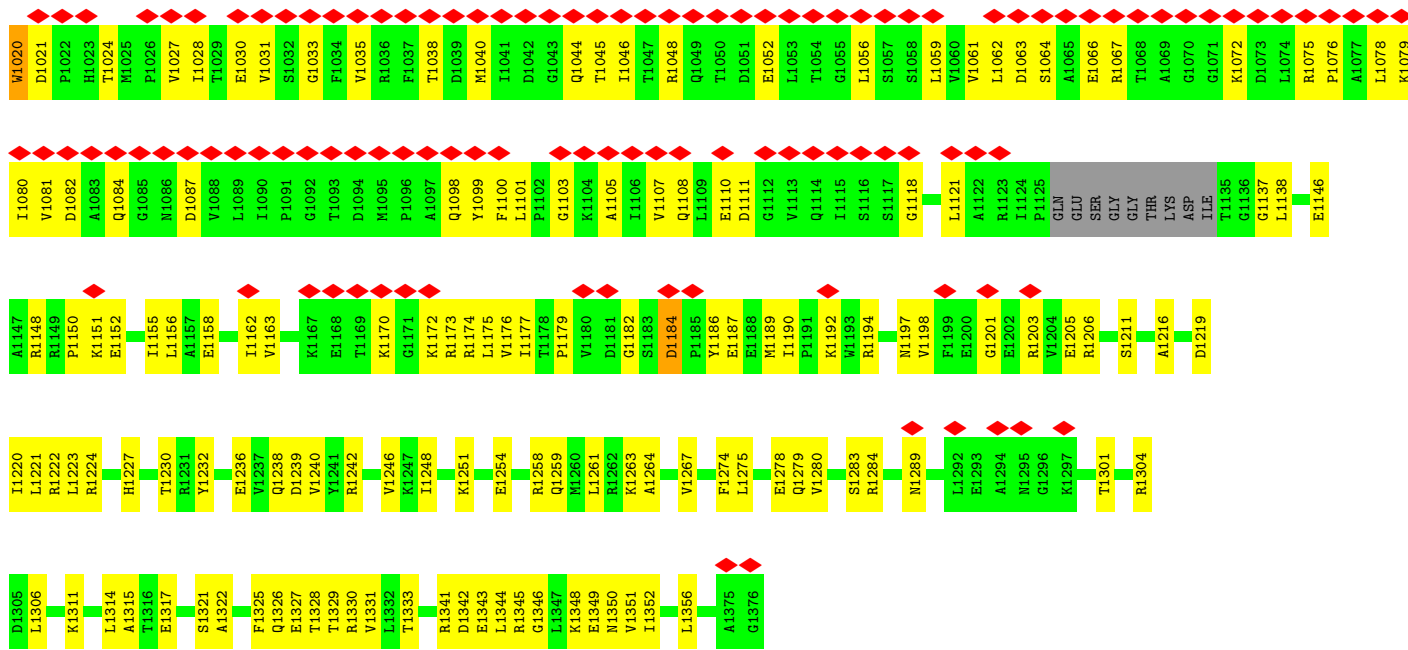
G1176	I1077	N1080	P1081	I1082	E1083	D1088	E1089	I1096	V1097	L1098	L1101	G1102	V1103	P1104	S1105	M1106	M1107	M1108	Q1111	I1112	I1113	E1114	A1121	K1120	G1123	I1124	G1125	D1126	K1127	Q1134	Q1135	Q1136	K1140	A1148	L1151	G1152	A1153	K1158	V1159	D1160	L1161	I1165	M1170	R1171	N1175										
G1179	I1182	A1183	V1186	F1187	D1188	E1194	L1198	L1204	I1210	G1211	L1212	T1217	G1218	E1219	E1222	R1223	V1224	V1225	Y1229	I1230	I1231	M1232	K1234	L1235	D1240	D1241	M1243	H1244	A1245	R1246	S1247	G1249	L1254	V1254	T1255	Q1256	P1258	L1259	Q1264	F1265	G1266	G1267													
D937	G938	V939	E940	K941	D942	K943	E947	I948	E949	E950	M951	Q952	K954	Q955	K958	D959	L960	S961	E962	E963	L964	Q965	E968	A969	G970	L971	F972	S973	R974	I975	R976	A977	V978	L979	V980	A981	G982	G983	V984	E985	A986	E987	K988	L989	D990	K991	L992	P993	R994	D995	R996	W997	L998	E999	L1000
G1001	L1002	T1003	D1004	E1005	I1006	K1007	Q1008	I1009	Q1010	L1011	E1012	Q1013	L1014	A1015	E1016	Q1017	G1018	P1019	L1020	L1021	K1022	H1023	E1024	F1025	E1026	L1027	K1028	L1029	E1030	A1031	K1032	R1033	I1036	T1037	D1040	D1041	L1042	A1043	V1046	L1047	L1048	I1049	L1054	R1058	L1069	H1070	G1071	N1072	K1073	R996	W997	L998	E999	L1000	
G1176	I1077	N1080	P1081	I1082	E1083	D1088	E1089	I1096	V1097	L1098	L1101	G1102	V1103	P1104	S1105	M1106	M1107	M1108	Q1111	I1112	I1113	E1114	A1121	K1120	G1123	I1124	G1125	D1126	K1127	Q1134	Q1135	Q1136	K1140	A1148	L1151	G1152	A1153	K1158	V1159	D1160	L1161	I1165	M1170	R1171	N1175										
G1179	I1182	A1183	V1186	F1187	D1188	E1194	L1198	L1204	I1210	G1211	L1212	T1217	G1218	E1219	E1222	R1223	V1224	V1225	Y1229	I1230	I1231	M1232	K1234	L1235	D1240	D1241	M1243	H1244	A1245	R1246	S1247	G1249	L1254	V1254	T1255	Q1256	P1258	L1259	Q1264	F1265	G1266	G1267													
D937	G938	V939	E940	K941	D942	K943	E947	I948	E949	E950	M951	Q952	K954	Q955	K958	D959	L960	S961	E962	E963	L964	Q965	E968	A969	G970	L971	F972	S973	R974	I975	R976	A977	V978	L979	V980	A981	G982	G983	V984	E985	A986	E987	K988	L989	D990	K991	L992	P993	R994	D995	R996	W997	L998	E999	L1000
G1001	L1002	T1003	D1004	E1005	I1006	K1007	Q1008	I1009	Q1010	L1011	E1012	Q1013	L1014	A1015	E1016	Q1017	G1018	P1019	L1020	L1021	K1022	H1023	E1024	F1025	E1026	L1027	K1028	L1029	E1030	A1031	K1032	R1033	I1036	T1037	D1040	D1041	L1042	A1043	V1046	L1047	L1048	I1049	L1054	R1058	L1069	H1070	G1071	N1072	K1073	R996	W997	L998	E999	L1000	
G1176	I1077	N1080	P1081	I1082	E1083	D1088	E1089	I1096	V1097	L1098	L1101	G1102	V1103	P1104	S1105	M1106	M1107	M1108	Q1111	I1112	I1113	E1114	A1121	K1120	G1123	I1124	G1125	D1126	K1127	Q1134	Q1135	Q1136	K1140	A1148	L1151	G1152	A1153	K1158	V1159	D1160	L1161	I1165	M1170	R1171	N1175										
G1179	I1182	A1183	V1186	F1187	D1188	E1194	L1198	L1204	I1210	G1211	L1212	T1217	G1218	E1219	E1222	R1223	V1224	V1225	Y1229	I1230	I1231	M1232	K1234	L1235	D1240	D1241	M1243	H1244	A1245	R1246	S1247	G1249	L1254	V1254	T1255	Q1256	P1258	L1259	Q1264	F1265	G1266	G1267													



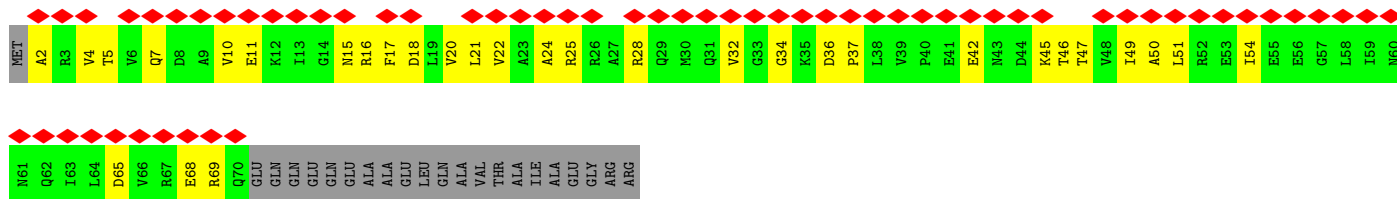
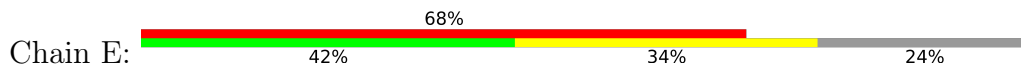


● Molecule 3: DNA-directed RNA polymerase subunit beta'

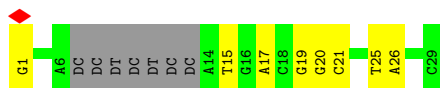




• Molecule 4: DNA-directed RNA polymerase subunit omega



• Molecule 5: DNA (29-MER)

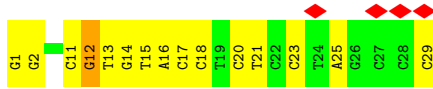


• Molecule 6: RNA (20-MER)



• Molecule 7: DNA (29-MER)





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	256565	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 ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.204	Depositor
Minimum map value	-0.111	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.006	Depositor
Recommended contour level	0.02	Depositor
Map size (Å)	343.2, 343.2, 343.2	wwPDB
Map dimensions	260, 260, 260	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.32, 1.32, 1.32	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: 2TM, ZN, 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	A	0.33	0/1816	0.63	0/2461
1	B	0.34	0/1808	0.69	2/2450 (0.1%)
2	C	0.38	0/10580	0.66	4/14274 (0.0%)
3	D	0.35	0/10577	0.67	7/14284 (0.0%)
4	E	0.27	0/548	0.63	0/738
5	N	0.59	0/506	0.96	0/777
6	R	0.66	0/274	1.18	2/427 (0.5%)
7	T	0.85	0/650	1.08	2/1000 (0.2%)
All	All	0.39	0/26759	0.70	17/36411 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
2	C	0	2
3	D	0	3
All	All	0	5

There are no bond length outliers.

The worst 5 of 17 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	D	758	PRO	CA-N-CD	-7.55	100.93	111.50
3	D	757	THR	C-N-CD	-6.51	106.27	120.60
3	D	802	ASP	CB-CG-OD1	6.05	123.75	118.30
3	D	1020	TRP	CA-CB-CG	6.02	125.14	113.70
3	D	802	ASP	CB-CG-OD2	-5.95	112.94	118.30

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	C	236	LYS	Peptide
2	C	595	THR	Peptide
3	D	1184	ASP	Peptide
3	D	860	ARG	Peptide
3	D	901	ARG	Peptide

## 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1794	0	1819	64	0
1	B	1786	0	1813	78	0
2	C	10414	0	10420	475	0
3	D	10419	0	10606	500	0
4	E	546	0	565	72	0
5	N	451	0	248	9	0
6	R	244	0	120	5	0
7	T	583	0	329	17	0
8	D	1	0	0	0	0
9	D	2	0	0	0	0
10	D	29	0	14	2	0
All	All	26269	0	25934	1077	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 21.

The worst 5 of 1077 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)
3:D:474:LEU:HD23	4:E:28:ARG:CG	1.56	1.32
3:D:910:ASN:ND2	4:E:15:ASN:OD1	1.74	1.20
3:D:474:LEU:HD23	4:E:28:ARG:HG2	1.15	1.08
3:D:474:LEU:CD2	4:E:28:ARG:CG	2.35	1.05
3:D:474:LEU:CD2	4:E:28:ARG:HG2	1.85	1.04

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	229/237 (97%)	213 (93%)	16 (7%)	0	100	100
1	B	228/237 (96%)	209 (92%)	17 (8%)	2 (1%)	17	53
2	C	1316/1340 (98%)	1209 (92%)	99 (8%)	8 (1%)	25	62
3	D	1338/1363 (98%)	1219 (91%)	114 (8%)	5 (0%)	34	68
4	E	67/91 (74%)	61 (91%)	6 (9%)	0	100	100
All	All	3178/3268 (97%)	2911 (92%)	252 (8%)	15 (0%)	32	65

5 of 15 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	21	SER
2	C	199	ASP
2	C	913	VAL
2	C	1041	ASP
3	D	338	PHE

### 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	199/204 (98%)	199 (100%)	0	100	100
1	B	198/204 (97%)	195 (98%)	3 (2%)	65	84

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	C	1139/1155 (99%)	1117 (98%)	22 (2%)	57	80
3	D	1117/1136 (98%)	1108 (99%)	9 (1%)	81	92
4	E	59/75 (79%)	59 (100%)	0	100	100
All	All	2712/2774 (98%)	2678 (99%)	34 (1%)	70	86

5 of 34 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	D	56	LEU
3	D	157	GLN
3	D	1289	ASN
2	C	936	ARG
2	C	935	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 15 such sidechains are listed below:

Mol	Chain	Res	Type
2	C	932	GLN
3	D	1108	GLN
2	C	1023	HIS
3	D	1279	GLN
3	D	458	ASN

### 5.3.3 RNA [i](#)

Mol	Chain	Analysed	Backbone Outliers	Pucker Outliers
6	R	10/11 (90%)	2 (20%)	0

All (2) RNA backbone outliers are listed below:

Mol	Chain	Res	Type
6	R	11	C
6	R	12	G

There are no RNA pucker outliers to report.



## 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 monosaccharides 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
10	2TM	D	2004	-	27,30,30	3.01	12 (44%)	39,47,47	1.12	4 (10%)

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
10	2TM	D	2004	-	-	6/19/38/38	0/2/2/2

The worst 5 of 12 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
10	D	2004	2TM	O2-C2	8.63	1.39	1.23
10	D	2004	2TM	PB-O3B	6.16	1.65	1.58
10	D	2004	2TM	PA-O5'	5.29	1.65	1.57
10	D	2004	2TM	C4-N4	4.96	1.45	1.33
10	D	2004	2TM	C2-N3	3.89	1.44	1.36

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
10	D	2004	2TM	C3'-C2'-C1'	2.89	106.93	101.43
10	D	2004	2TM	PB-O3B-PG	-2.88	122.49	132.62
10	D	2004	2TM	C4'-O4'-C1'	-2.20	104.62	109.47
10	D	2004	2TM	C2'-C3'-C4'	2.06	106.64	102.64

There are no chirality outliers.

5 of 6 torsion outliers are listed below:

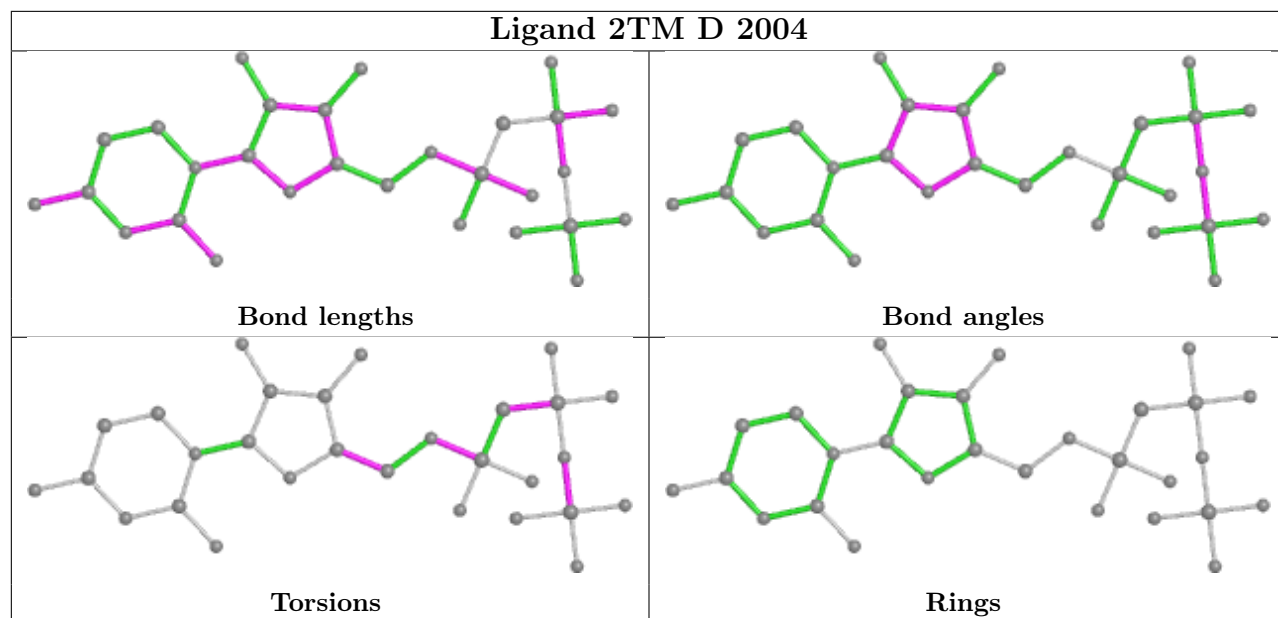
Mol	Chain	Res	Type	Atoms
10	D	2004	2TM	C5'-O5'-PA-O1A
10	D	2004	2TM	O4'-C4'-C5'-O5'
10	D	2004	2TM	PA-C1-PB-O3B
10	D	2004	2TM	PA-C1-PB-O1B
10	D	2004	2TM	PA-C1-PB-O2B

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	D	2004	2TM	2	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 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.

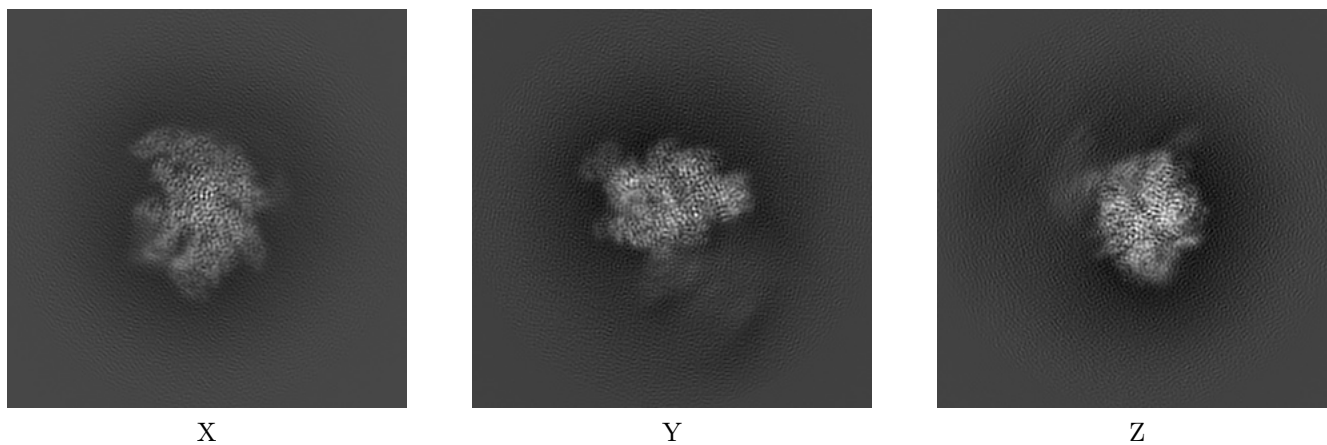
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-23901. These allow visual inspection of the internal detail of the map and identification of artifacts.

No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

### 6.1 Orthogonal projections [i](#)

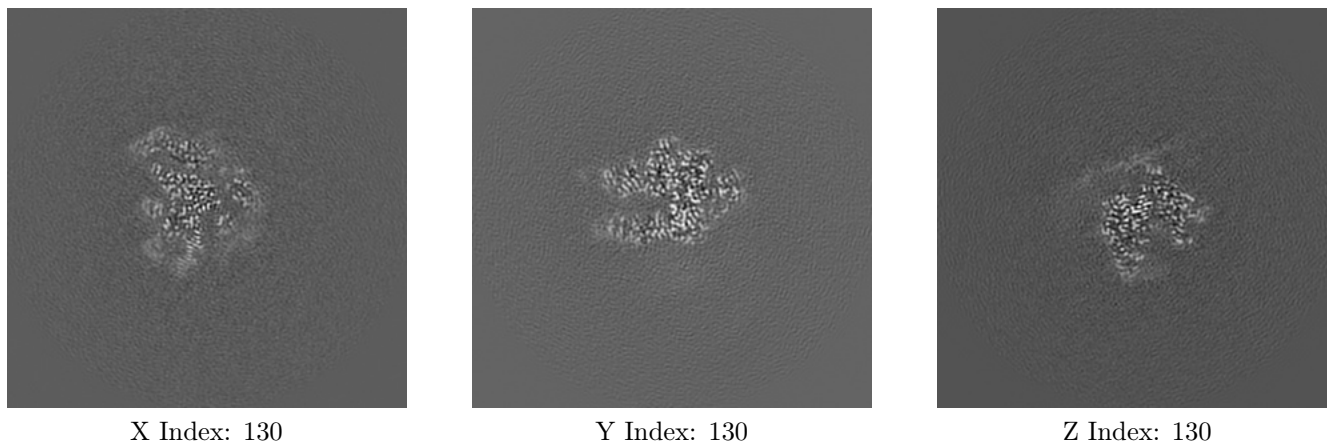
#### 6.1.1 Primary map



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

### 6.2 Central slices [i](#)

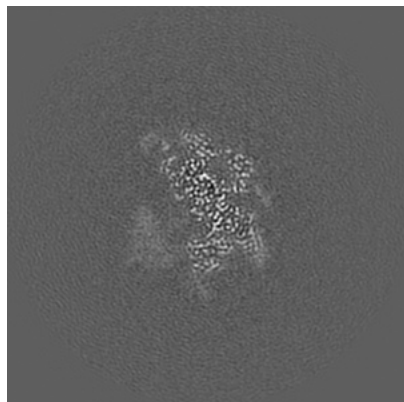
#### 6.2.1 Primary map



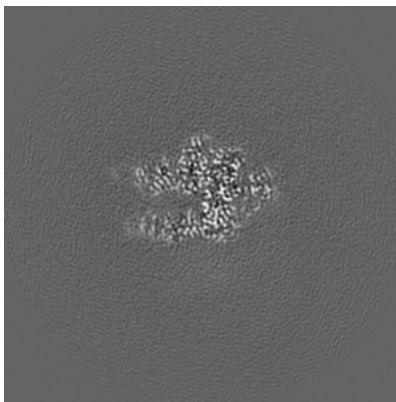
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

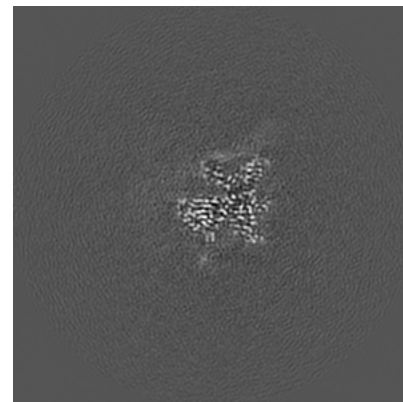
### 6.3.1 Primary map



X Index: 147



Y Index: 130

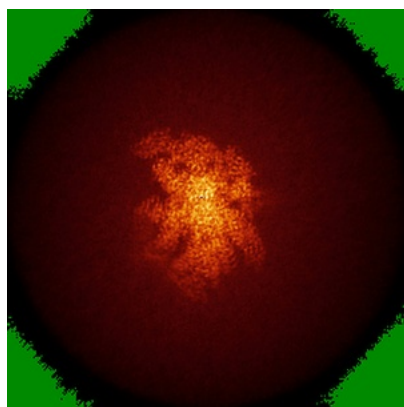


Z Index: 138

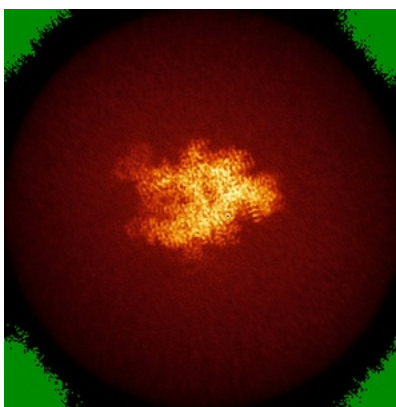
The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

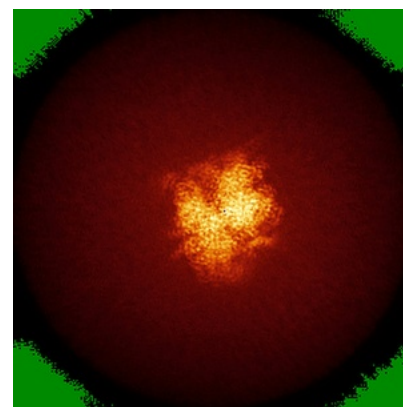
### 6.4.1 Primary map



X



Y



Z

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.

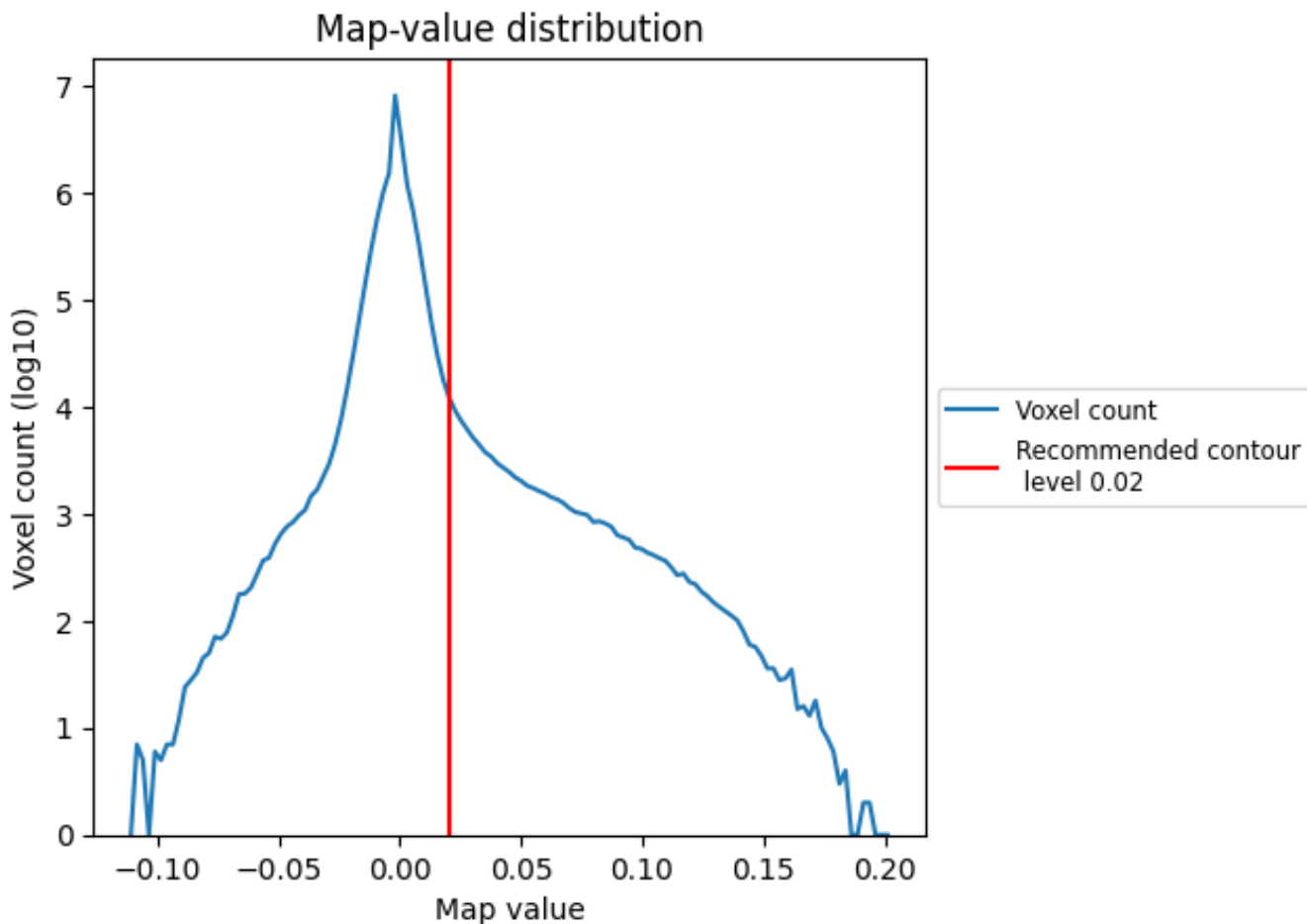
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

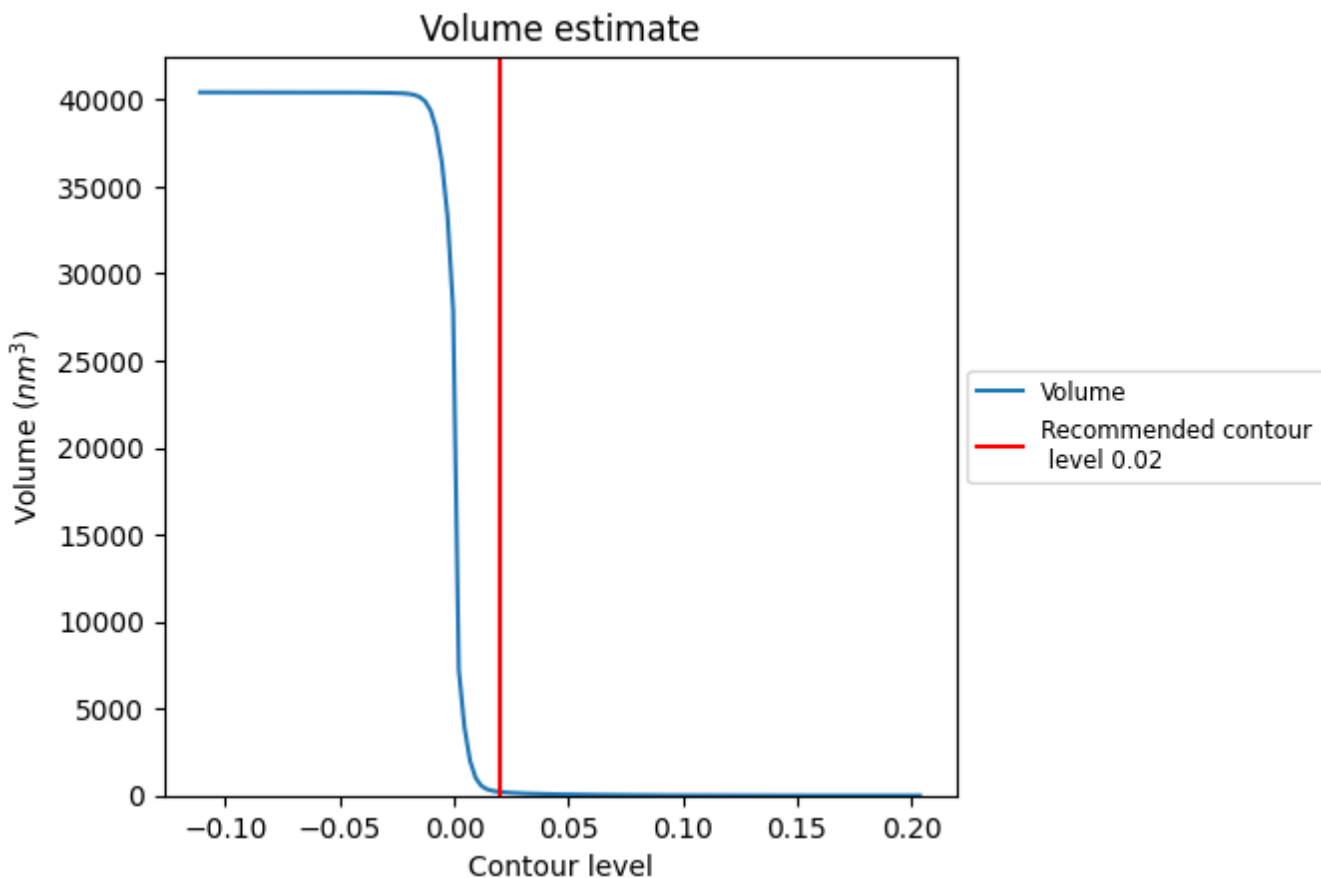
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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](#)

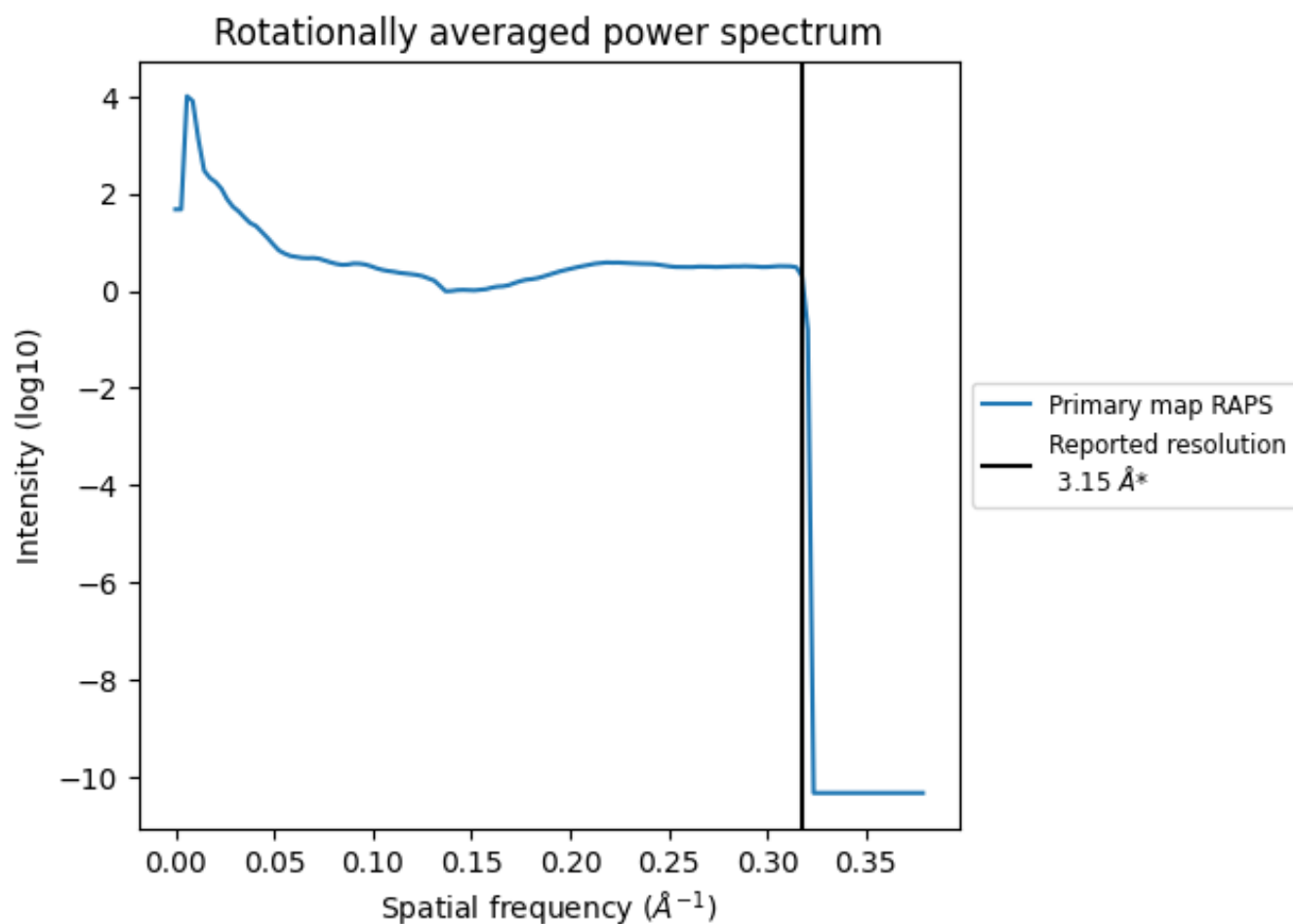


The volume at the recommended contour level is 211 nm<sup>3</sup>; this corresponds to an approximate mass of 191 kDa.

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  $0.317 \text{\AA}^{-1}$

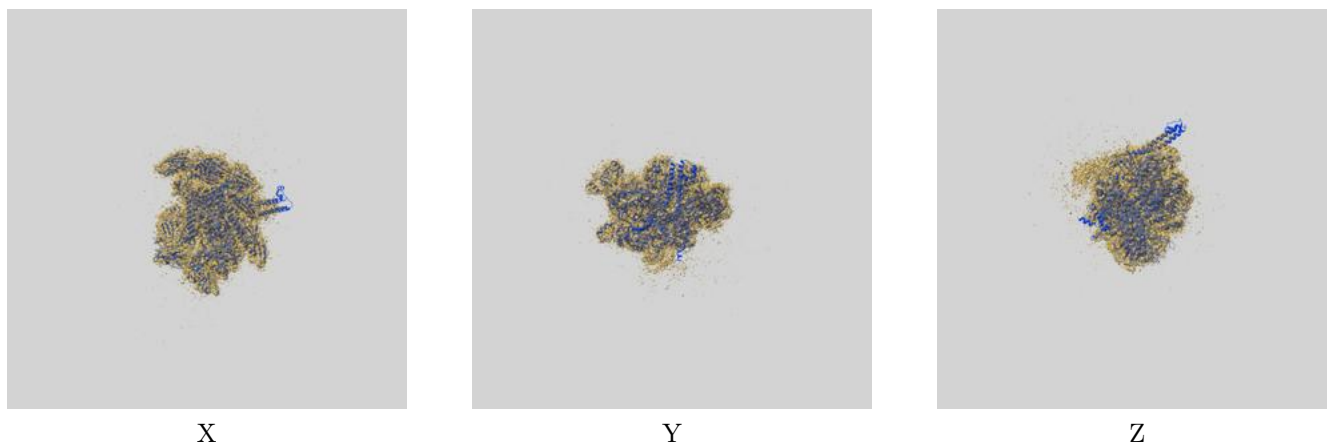
## 8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

## 9 Map-model fit [i](#)

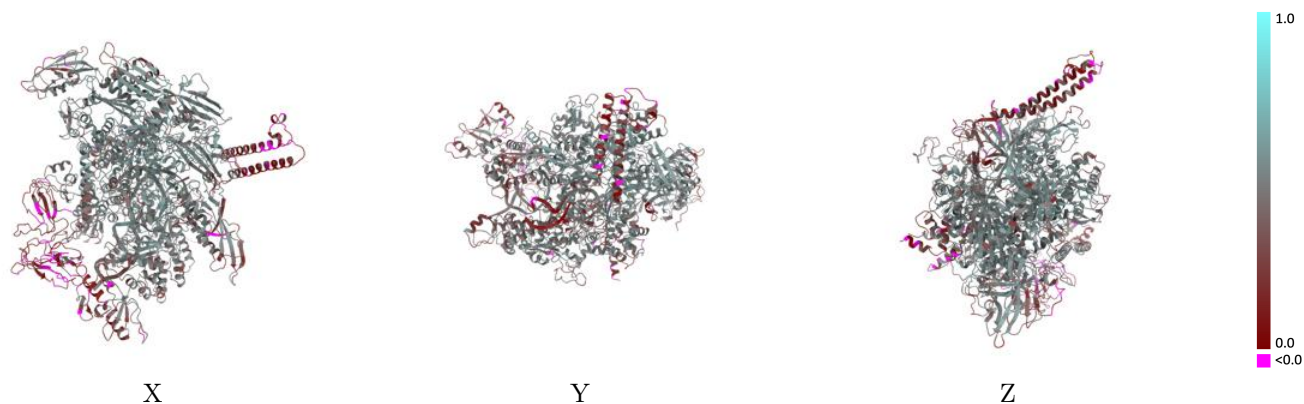
This section contains information regarding the fit between EMDB map EMD-23901 and PDB model 7MKO. Per-residue inclusion information can be found in section [3](#) on page [7](#).

### 9.1 Map-model overlay [i](#)



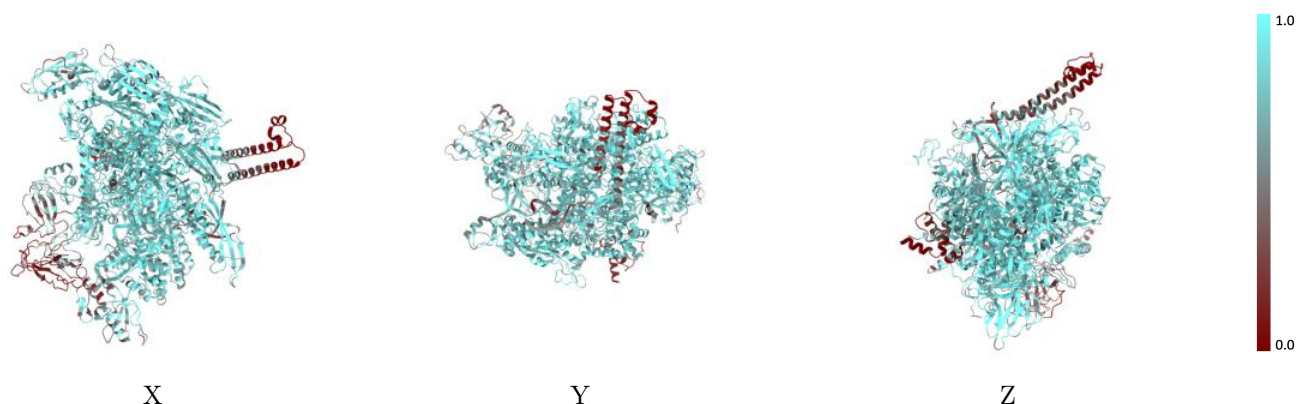
The images above show the 3D surface view of the map at the recommended contour level 0.02 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model [\(i\)](#)



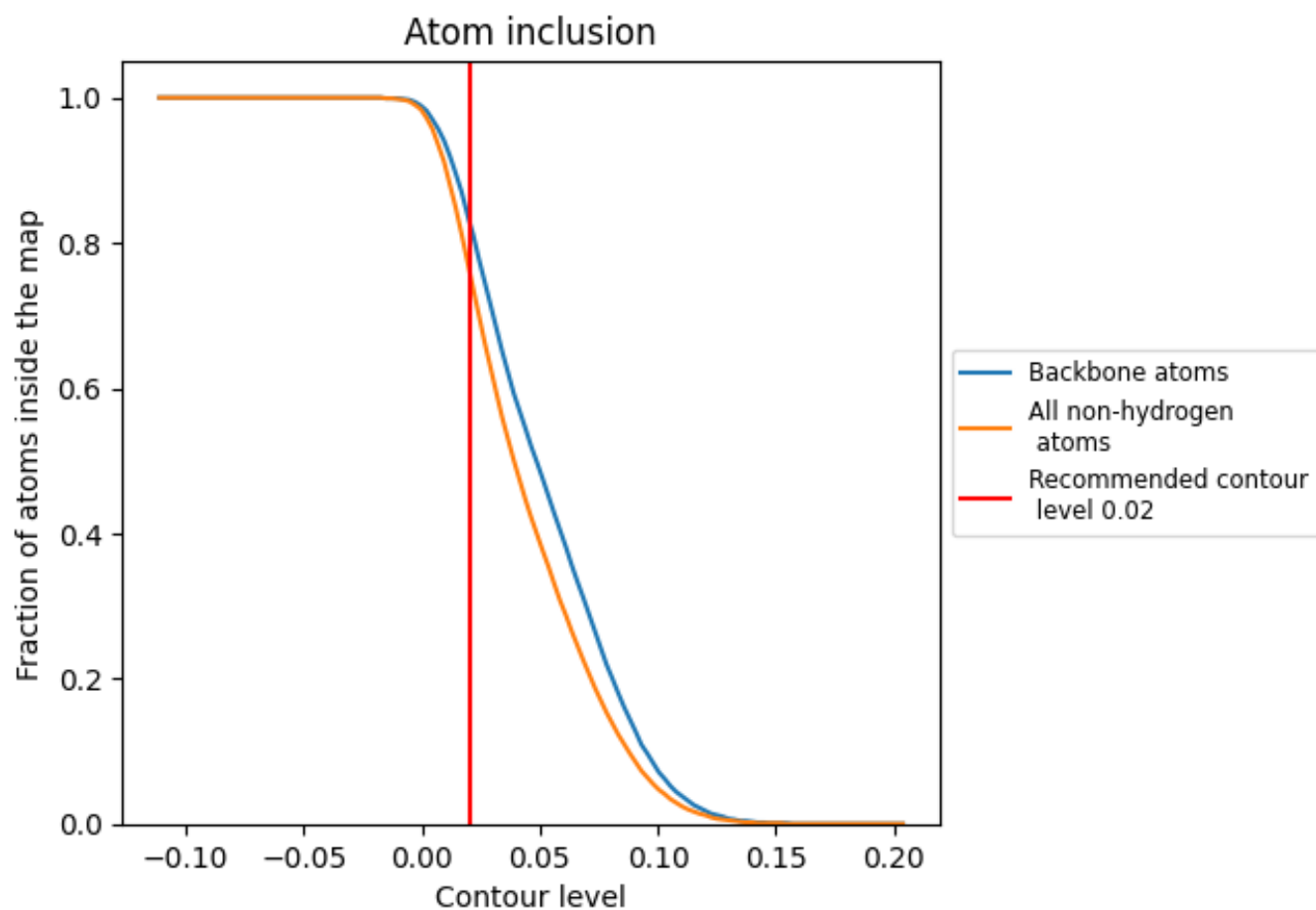
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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



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, 83% of all backbone atoms, 76% 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	 0.7640	 0.4330
A	 0.8250	 0.4790
B	 0.7840	 0.4440
C	 0.7920	 0.4520
D	 0.7490	 0.4170
E	 0.1430	 0.2290
N	 0.7780	 0.3800
R	 0.8970	 0.5160
T	 0.7750	 0.4030

