



## wwPDB EM Validation Summary Report ⓘ

Oct 3, 2024 – 10:21 AM EDT

PDB ID : 8TW9  
EMDB ID : EMD-41663  
Title : Cryo-EM structure of *S. cerevisiae* PolE-Ctf18-8-1-DNA  
Authors : Yuan, Z.; Georgescu, R.; O'Donnell, M.; Li, H.  
Deposited on : 2023-08-20  
Resolution : 3.60 Å (reported)

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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.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.39

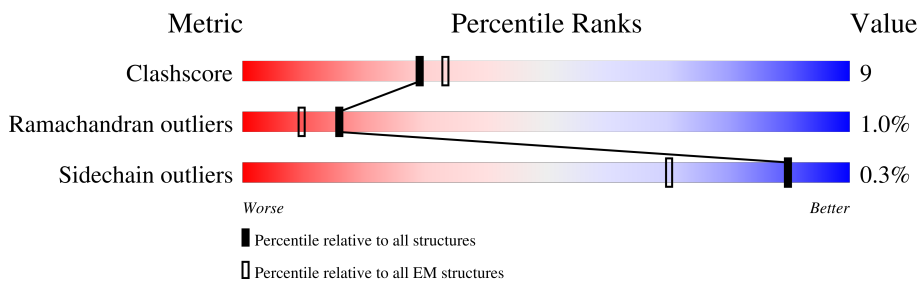
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.60 Å.

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



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

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	C	26	
2	P	9	
3	T	15	
4	E	2222	
5	D	132	
6	B	380	

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
7	SF4	E	2301	-	-	X	-

## 2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 13586 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 Chromosome transmission fidelity protein 18.

Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
1	C	26	206	132	37	37	0	0

- Molecule 2 is a DNA chain called Primer DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
2	P	9	183	88	29	57	9	0	0

- Molecule 3 is a DNA chain called Template DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
3	T	15	303	147	54	88	14	0	0

- Molecule 4 is a protein called DNA polymerase epsilon catalytic subunit A.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	E	1124	8919	5681	1507	1690	41	0	0

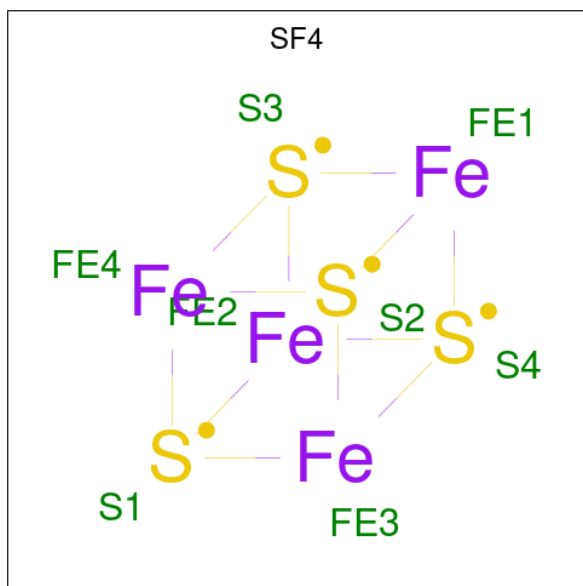
- Molecule 5 is a protein called Chromosome transmission fidelity protein 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	D	132	1014	642	171	194	7	0	0

- Molecule 6 is a protein called Sister chromatid cohesion protein DCC1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	B	374	2953	1893	489	557	14	0	0

- Molecule 7 is IRON/SULFUR CLUSTER (three-letter code: SF4) (formula: Fe<sub>4</sub>S<sub>4</sub>).

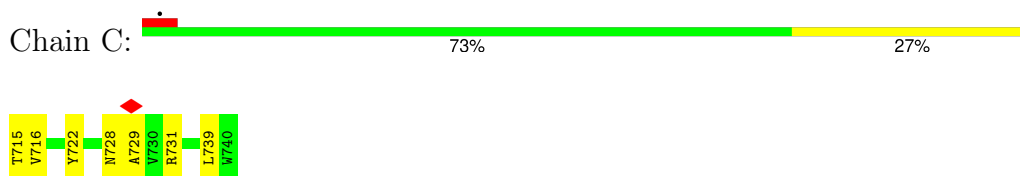


Mol	Chain	Residues	Atoms			AltConf
			Total	Fe	S	
7	E	1	8	4	4	0

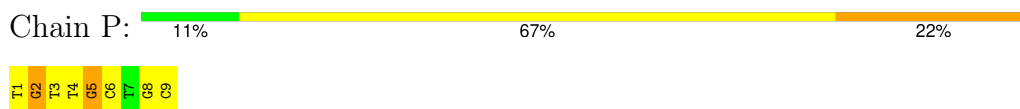
### 3 Residue-property plots

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.

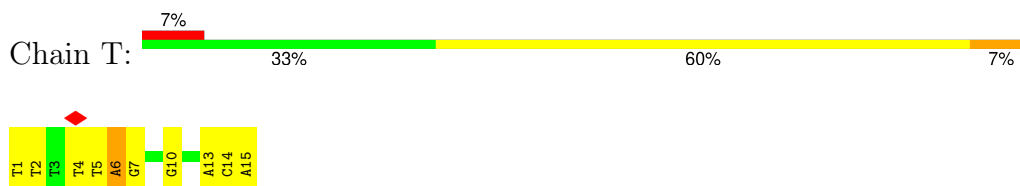
- Molecule 1: Chromosome transmission fidelity protein 18



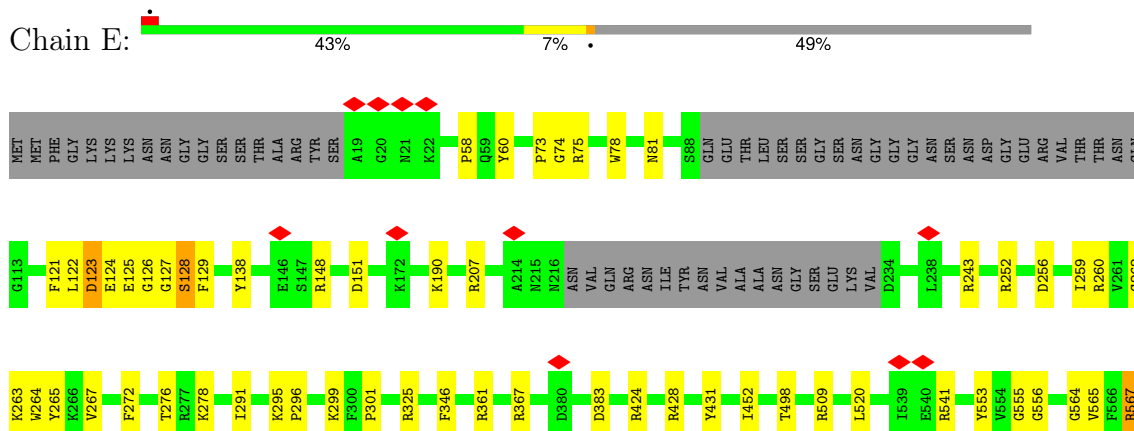
- Molecule 2: Primer DNA



- Molecule 3: Template DNA



- Molecule 4: DNA polymerase epsilon catalytic subunit A



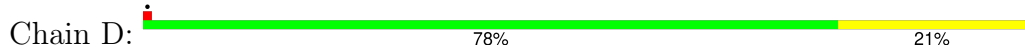
SE68	D669	K606	R630	D640	Y645	P646	M647	T650	R653	P656	D657	S658	I659	K660	C665	C668	M671	R672	C677	K811	M812	I813	V814	L815	Y816	R866	D695	I700	K701	R702	A703	L704	F709	K718	L726	I733	R738	E741	K745	C763	Q764															
R765	E766	N767	P768	F769	Y770	F777	R780	Y845	P846	M847	T850	R853	P856	D857	S858	I859	K860	C865	C868	M871	R872	C877	K811	M812	I813	V814	L815	Y816	R866	D695	I700	K701	R702	A703	L704	F709	K718	L726	I733	R738	E741	K745	C763	Q764												
G848	L883	R913	P929	P856	S957	F961	G962	K967	R968	Y969	A970	F972	A975	E980	L981	K982	F984	L986	K987	R988	R989	G990	Q993	D1001	F1002	F1003	D1010	V1019	R1025	M1036	D1041	V1043	S1044	L1045	I1046	C1047	F1048	I1049	R1050	M1052																
S1053	K1054	T1055	L1056	K1057	E1058	Y1059	G1061	S1064	T1068	R1072	F1076	L1077	GLY	GLU	ASP	MET	VAL	LYS	D1084	R1105	F1112	L1132	R1147	E1148	R1149	I1154	Q1155	K1156	I1157	I1158	T1159	I1160	P1161	L1164	W1179	K1183	K1187	E1188	D1189	LYS	PHE	LYS	GLN	THR	SER											
LEU	THR	LYS	PHE	THR	LYS	THR	LYS	ASN	VAL	PRO	THR	ASP	THR	MET	GLY	LYS	VAL	GLY	PRO	THR	LYS	THR	ASP	ASN	ALA	LYS	ARG	THR	LYS	THR	LYS	VAL	ARG	LYS	ARG	LYS	ALA	LYS	ARG	ASN	GLN	THR	LEU	PRO												
LEU	VAL	LEU	PRO	SER	THR	ILE	PRO	SER	VAL	GLY	THR	TYR	VAL	GLY	LYS	VAL	GLY	THR	ILE	LEU	GLN	LYS	THR	ASP	ASN	ALA	LYS	ARG	THR	LYS	THR	LYS	VAL	ARG	LYS	ARG	LYS	ALA	LYS	ARG	ASN	GLN	THR	LEU	PRO											
SER	TYR	ALA	THR	THR	THR	ILE	THR	SER	VAL	GLY	TYR	ASP	THR	MET	GLY	LYS	VAL	GLN	LYS	THR	ILE	LEU	GLN	LYS	THR	ASP	ASN	ALA	LYS	ARG	THR	LYS	THR	LYS	VAL	ARG	LYS	ARG	LYS	ALA	LYS	ARG	ASN	GLN	THR	LEU	PRO									
ILE	GLU	LYS	SER	SER	THR	ILE	PRO	PRO	ASN	ASN	THR	ASP	THR	SER	THR	LYS	VAL	GLN	LYS	THR	ILE	LEU	GLN	LYS	THR	ASP	ASN	ALA	LYS	ARG	THR	LYS	THR	LYS	VAL	ARG	LYS	ARG	LYS	ALA	LYS	ARG	ASN	GLN	THR	LEU	PRO									
ARG	ALA	ILE	MET	LEU	GLY	ALA	ALA	ALA	MET	GLY	VAL	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU							
TYR	GLU	PHE	THR	LEU	PHE	LYS	SER	THR	THR	ILE	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU						
ILE	ASN	PHE	GLU	PHE	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR					
SER	LEU	ASN	GLU	VAL	LEU	LEU	PRO	GLN	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR					
TYR	ALA	ARG	LYS	THR	LEU	GLY	GLU	ASN	GLU	LYS	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA				
VAL	ASP	ASN	THR	VAL	VAL	ASN	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR			
LYS	GLU	TRP	ASP	GLU	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA	ALA			
SER	THR	ILE	VAL	TYR	ALA	THR	LYS	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR			
ASN	PHE	SER	GLY	LEU	ALA	GLY	GLU	ASN	GLN	ASP	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN		
SER	THR	ILE	VAL	TYR	ALA	GLY	GLU	ASN	GLN	ASP	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	GLN	
VAL	ILE	PRO	PRO	PRO	GLY	GLN	GLM	PRO	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL	VAL

ASP PRO SER  
 LEU SER LEU  
 ILE ASP LEU  
 GLN SER LEU  
 VAL LEU VAL  
 VAL PRO ASP  
 PHE ARG CYS  
 LEU CYS GLU  
 TYR TYR CYS  
 LYS CYS PHE  
 ARG ASP PHE  
 ILE ILE ASP  
 SER ASP CYS  
 LEU CYS CYS  
 LYS LYS ALA  
 ALA ILE ASP  
 PRO CYS CYS  
 VAL PHE CYS  
 LYS LYS LYS  
 ALA ALA ASN  
 GLN VAL VAL  
 LEU LEU LEU  
 GLN GLN HIS  
 LEU LEU LEU  
 ILE ILE ASP  
 LEU LEU LEU  
 SER SER GLU

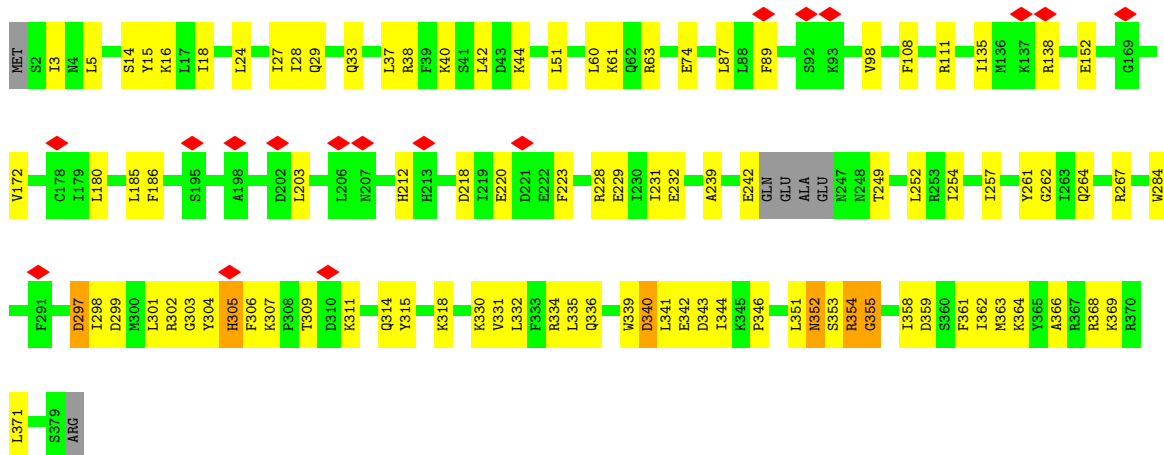
SER TYR LEU  
 ILE ASP LEU  
 GLN ASP LEU  
 THR THR ILE  
 CYS ILE ALA  
 ASP THR THR  
 ILE ILE ILE  
 LEU LEU LEU  
 SER SER SER

CYS ILE  
 ALA ASP  
 THR THR  
 ILE ILE

• Molecule 5: Chromosome transmission fidelity protein 8



• Molecule 6: Sister chromatid cohesion protein DCC1





## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	385806	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 ( $e^-/\text{\AA}^2$ )	60	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	1.409	Depositor
Minimum map value	-0.591	Depositor
Average map value	0.009	Depositor
Map value standard deviation	0.060	Depositor
Recommended contour level	0.326	Depositor
Map size (Å)	211.968, 211.968, 211.968	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.828, 0.828, 0.828	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: SF4

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	C	0.42	0/211	0.62	0/289
2	P	1.46	3/203 (1.5%)	1.04	1/311 (0.3%)
3	T	1.41	1/339 (0.3%)	1.00	1/521 (0.2%)
4	E	0.70	1/9121 (0.0%)	0.98	30/12348 (0.2%)
5	D	0.36	0/1030	0.76	1/1387 (0.1%)
6	B	0.51	3/3016 (0.1%)	0.76	8/4083 (0.2%)
All	All	0.69	8/13920 (0.1%)	0.92	41/18939 (0.2%)

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
4	E	0	6
6	B	0	2
All	All	0	8

The worst 5 of 8 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	B	354	ARG	C-N	11.75	1.54	1.33
4	E	766	GLU	C-N	9.57	1.56	1.34
2	P	2	DG	C1'-N9	-8.87	1.34	1.47
2	P	8	DG	C1'-N9	-8.59	1.35	1.47
2	P	5	DG	C1'-N9	-6.77	1.37	1.47

The worst 5 of 41 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	E	325	ARG	NE-CZ-NH1	10.08	125.34	120.30
4	E	913	ARG	NE-CZ-NH1	9.53	125.07	120.30
4	E	672	ARG	NE-CZ-NH2	-9.35	115.62	120.30
4	E	672	ARG	NE-CZ-NH1	9.05	124.83	120.30
4	E	361	ARG	NE-CZ-NH1	9.02	124.81	120.30

There are no chirality outliers.

5 of 8 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
4	E	123	ASP	Mainchain
4	E	509	ARG	Sidechain
4	E	567	ARG	Sidechain
4	E	630	ARG	Sidechain
4	E	81	ASN	Mainchain

## 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	C	206	0	183	8	0
2	P	183	0	102	6	0
3	T	303	0	172	15	0
4	E	8919	0	8572	150	0
5	D	1014	0	1007	29	0
6	B	2953	0	2913	72	0
7	E	8	0	0	6	0
All	All	13586	0	12949	240	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 9.

The worst 5 of 240 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)
4:E:656:PRO:HB3	4:E:843:SER:HB2	1.46	0.95

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:T:5:DT:H4'	4:E:835:MET:CB	2.08	0.83
4:E:60:TYR:CB	4:E:73:PRO:HG3	2.13	0.79
2:P:2:DG:H2'	2:P:3:DT:H71	1.68	0.76
4:E:671:ASN:HB2	7:E:2301:SF4:S3	2.26	0.75

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	C	24/26 (92%)	22 (92%)	2 (8%)	0	100	100
4	E	1116/2222 (50%)	1051 (94%)	52 (5%)	13 (1%)	11	43
5	D	130/132 (98%)	127 (98%)	3 (2%)	0	100	100
6	B	370/380 (97%)	342 (92%)	25 (7%)	3 (1%)	16	51
All	All	1640/2760 (59%)	1542 (94%)	82 (5%)	16 (1%)	16	46

5 of 16 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	E	833	TYR
4	E	845	GLU
4	E	846	MET
4	E	987	LYS
4	E	1053	SER

### 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	C	20/24 (83%)	20 (100%)	0	100	100
4	E	950/2014 (47%)	946 (100%)	4 (0%)	89	95
5	D	110/119 (92%)	110 (100%)	0	100	100
6	B	326/352 (93%)	326 (100%)	0	100	100
All	All	1406/2509 (56%)	1402 (100%)	4 (0%)	90	96

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	E	256	ASP
4	E	795	LEU
4	E	827	LEU
4	E	834	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 7 such sidechains are listed below:

Mol	Chain	Res	Type
4	E	828	ASN
4	E	993	GLN
6	B	29	GLN
4	E	997	ASN
4	E	794	ASN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

## 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](#)

1 ligand is 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
7	SF4	E	2301	4	0,12,12	-	-	-		

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
7	SF4	E	2301	4	-	-	0/6/5/5

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.

1 monomer is involved in 6 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
7	E	2301	SF4	6	0

## 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.

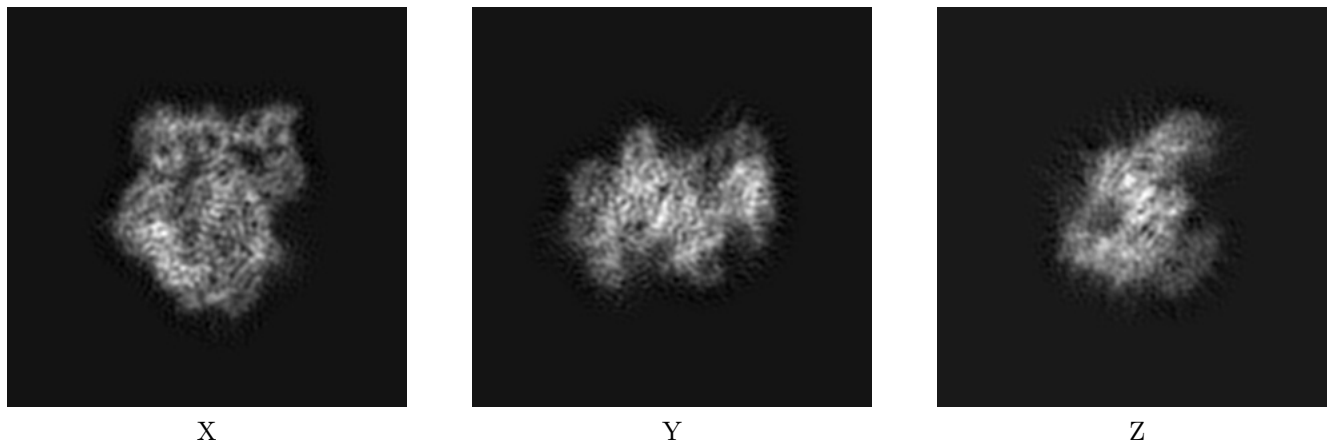
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-41663. These allow visual inspection of the internal detail of the map and identification of artifacts.

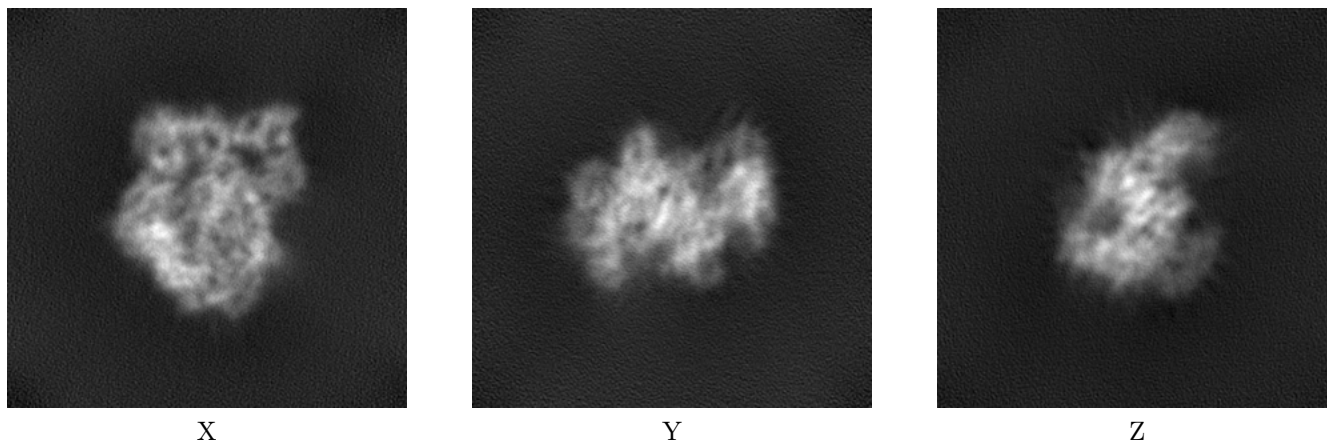
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

#### 6.1.1 Primary map



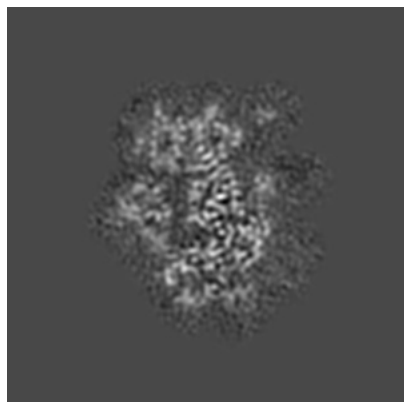
#### 6.1.2 Raw map



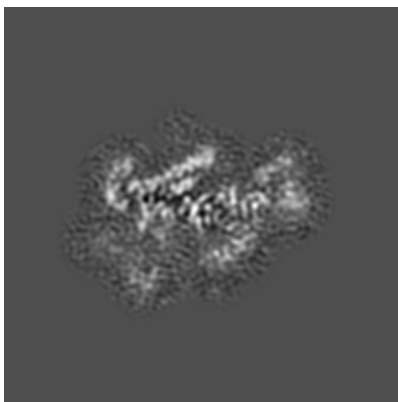
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

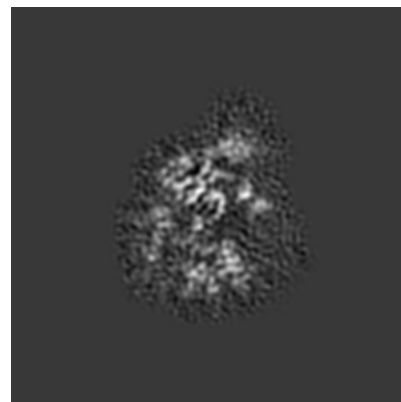
### 6.2.1 Primary map



X Index: 128

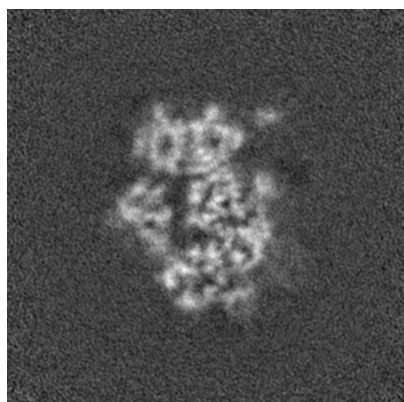


Y Index: 128

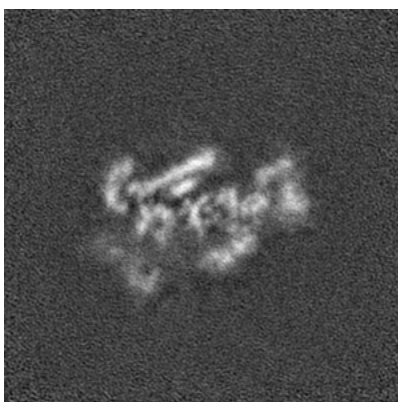


Z Index: 128

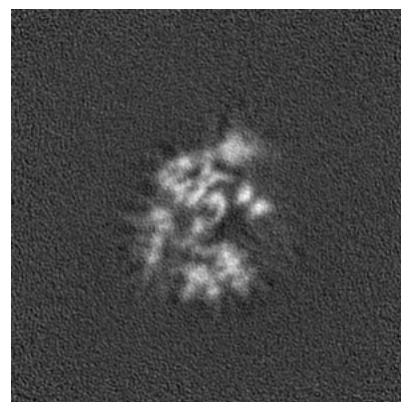
### 6.2.2 Raw map



X Index: 128



Y Index: 128



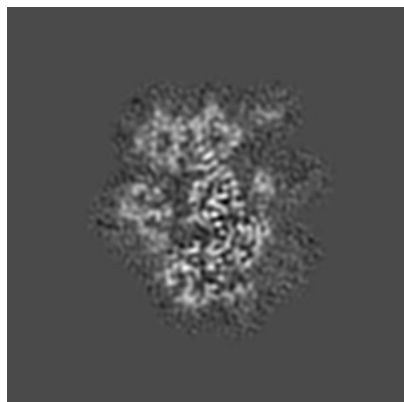
Z Index: 128

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

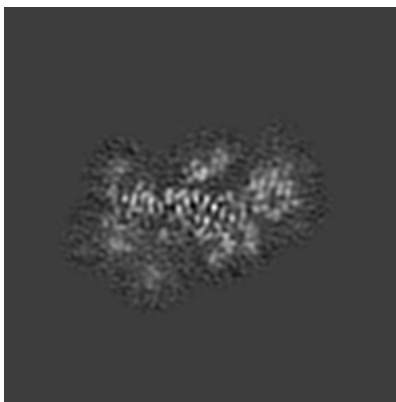


## 6.3 Largest variance slices [i](#)

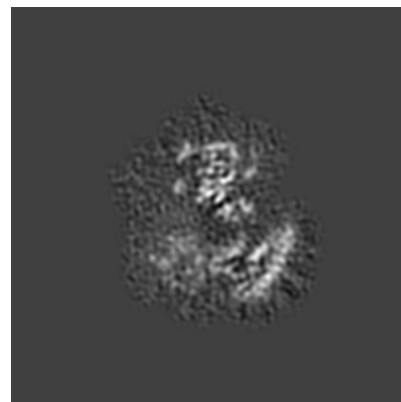
### 6.3.1 Primary map



X Index: 129

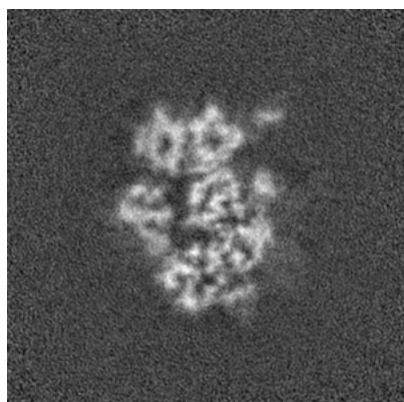


Y Index: 136

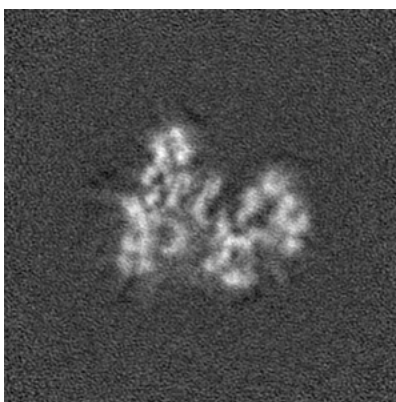


Z Index: 111

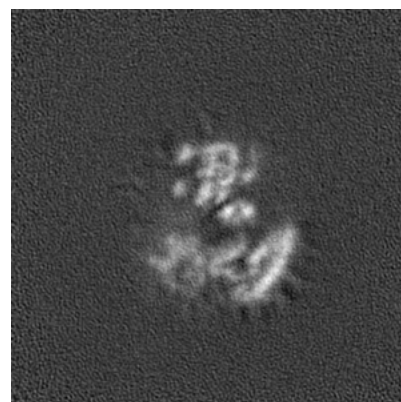
### 6.3.2 Raw map



X Index: 129



Y Index: 102

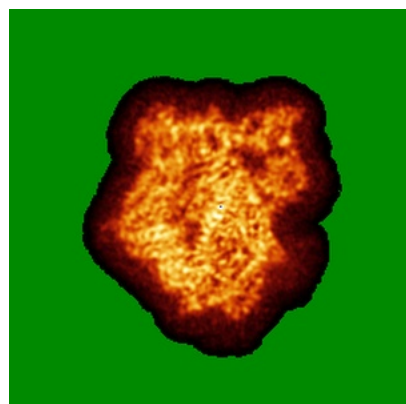


Z Index: 111

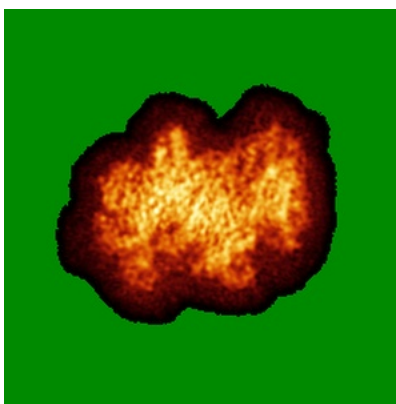
The images above show the largest variance slices of the map in three orthogonal directions.

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

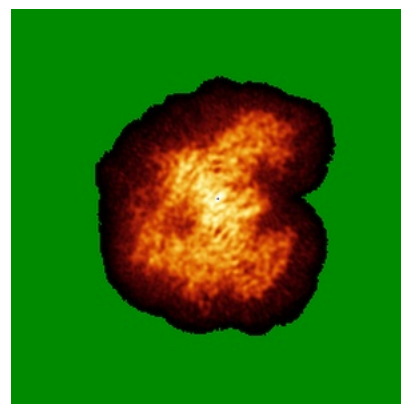
### 6.4.1 Primary map



X

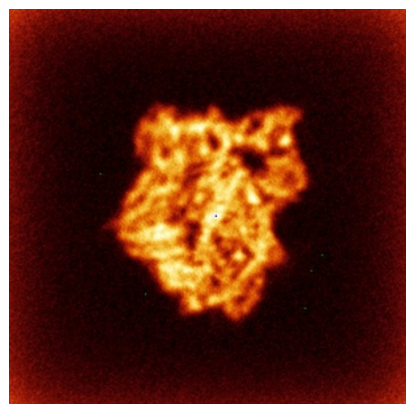


Y

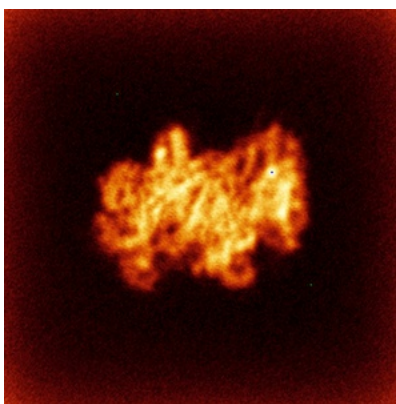


Z

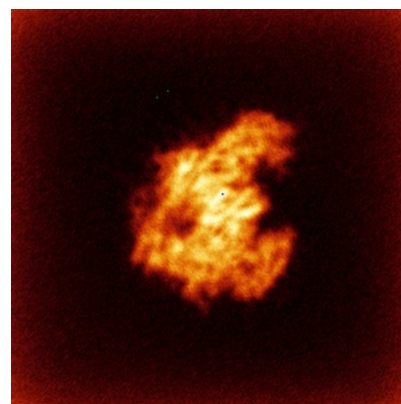
### 6.4.2 Raw map



X



Y

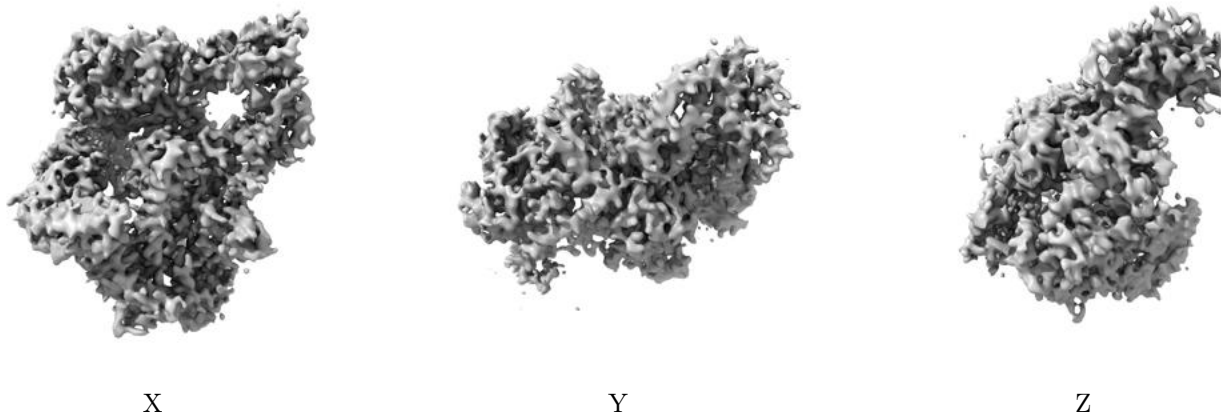


Z

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.

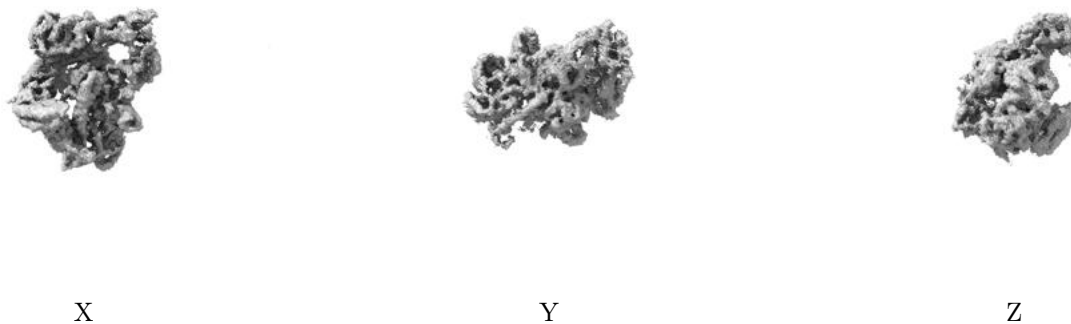
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.326. 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



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.

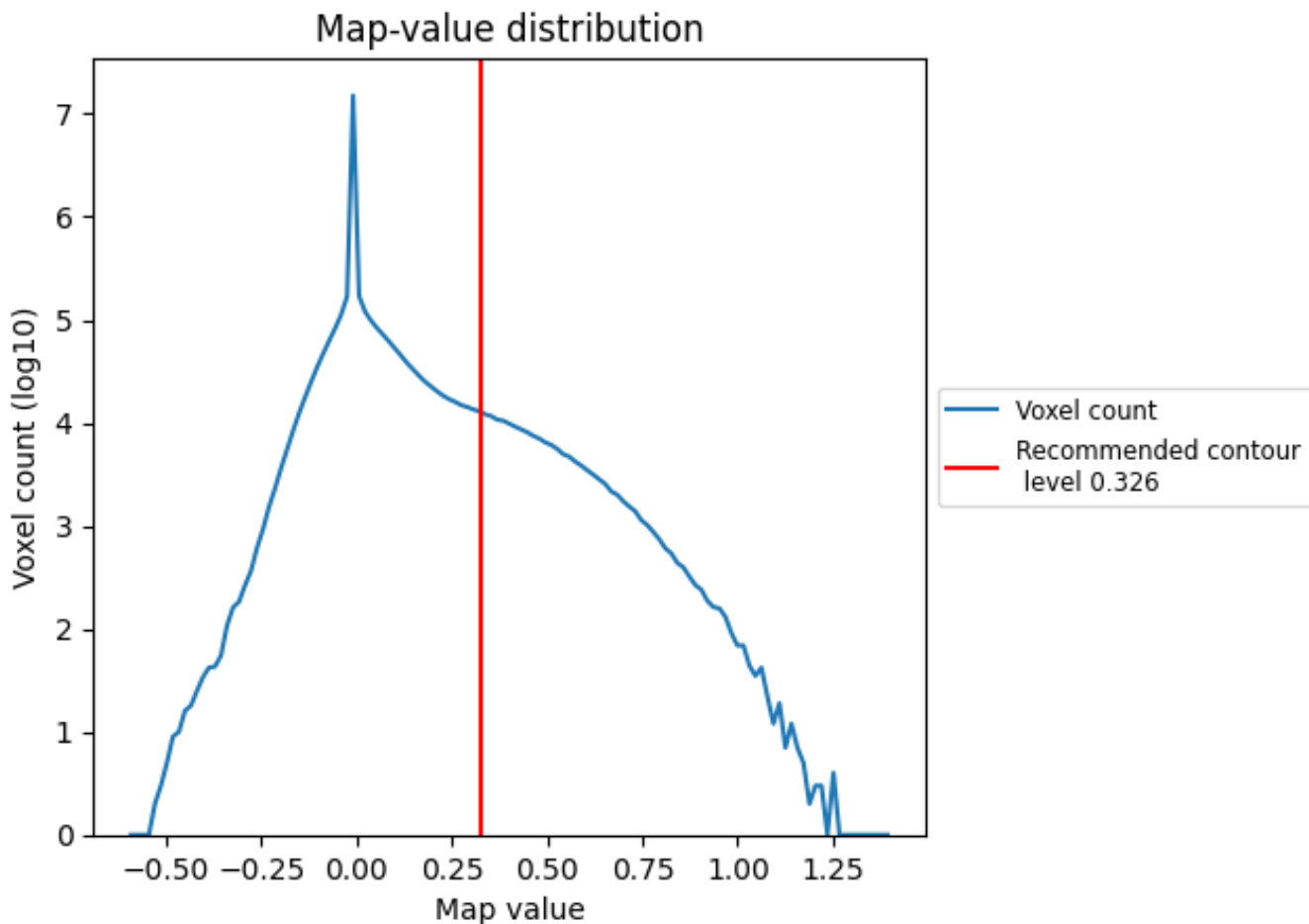
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

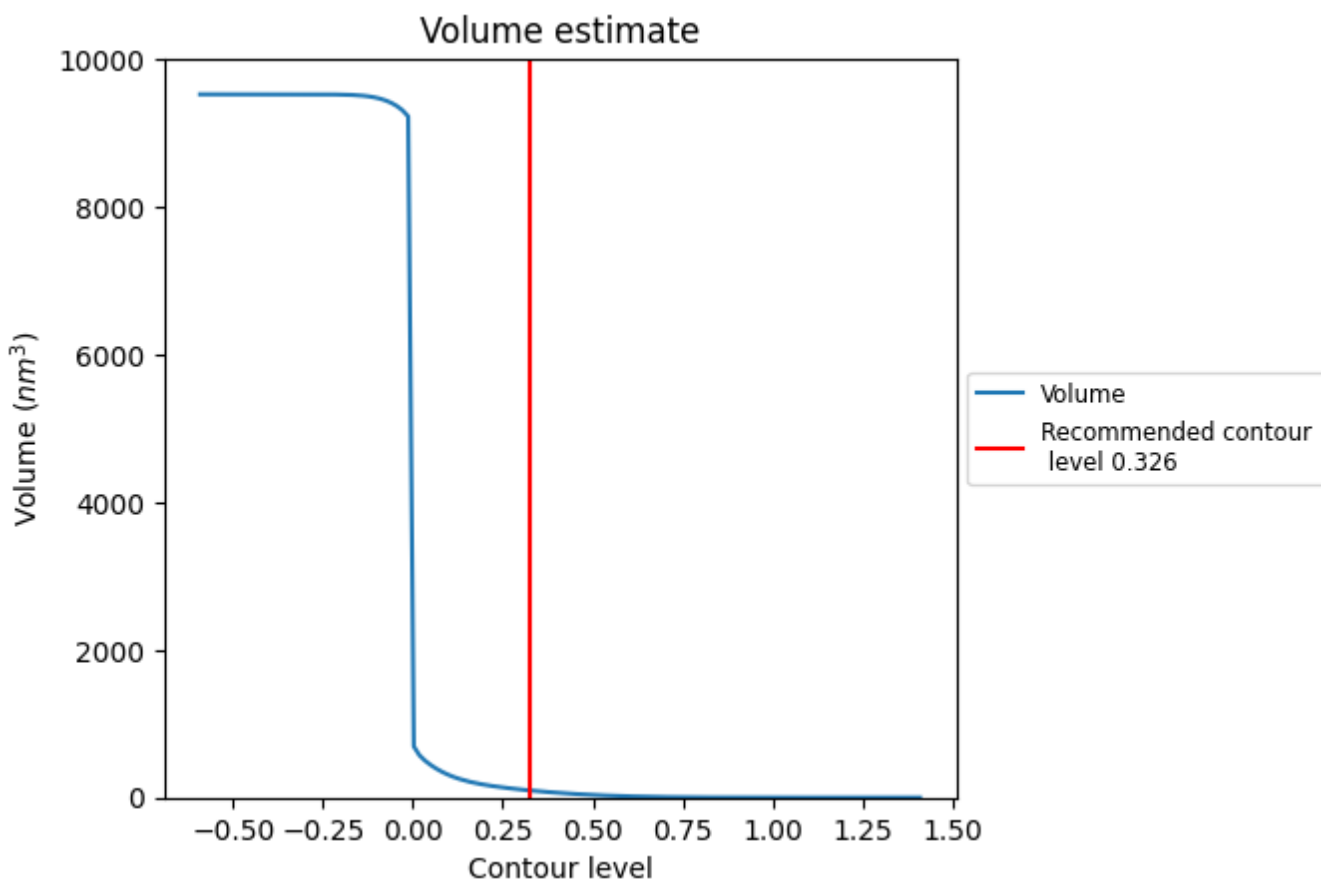
This section contains the results of statistical analysis of the map.

### 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.

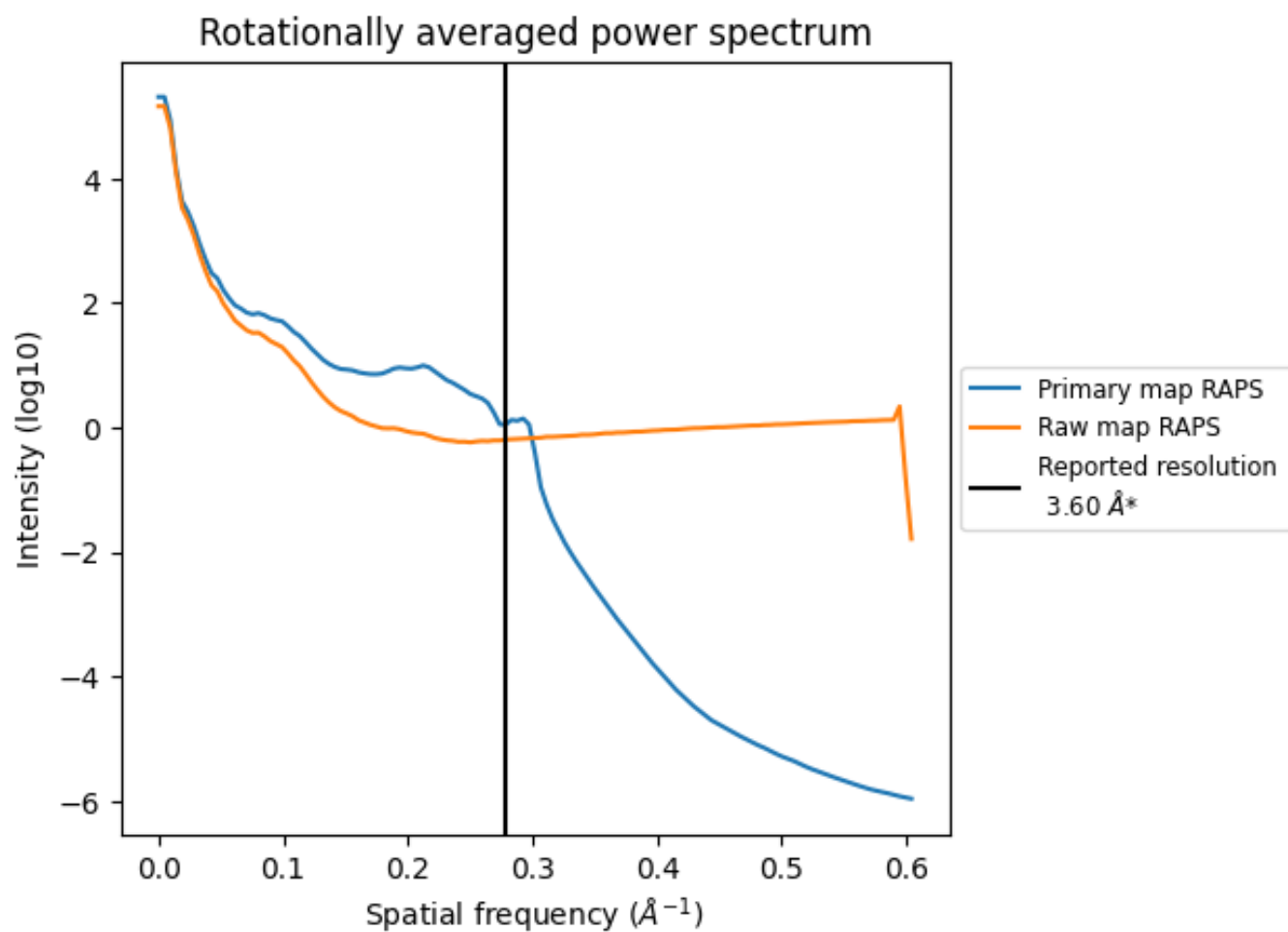
## 7.2 Volume estimate [\(i\)](#)



The volume at the recommended contour level is 96 nm<sup>3</sup>; this corresponds to an approximate mass of 87 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](#)

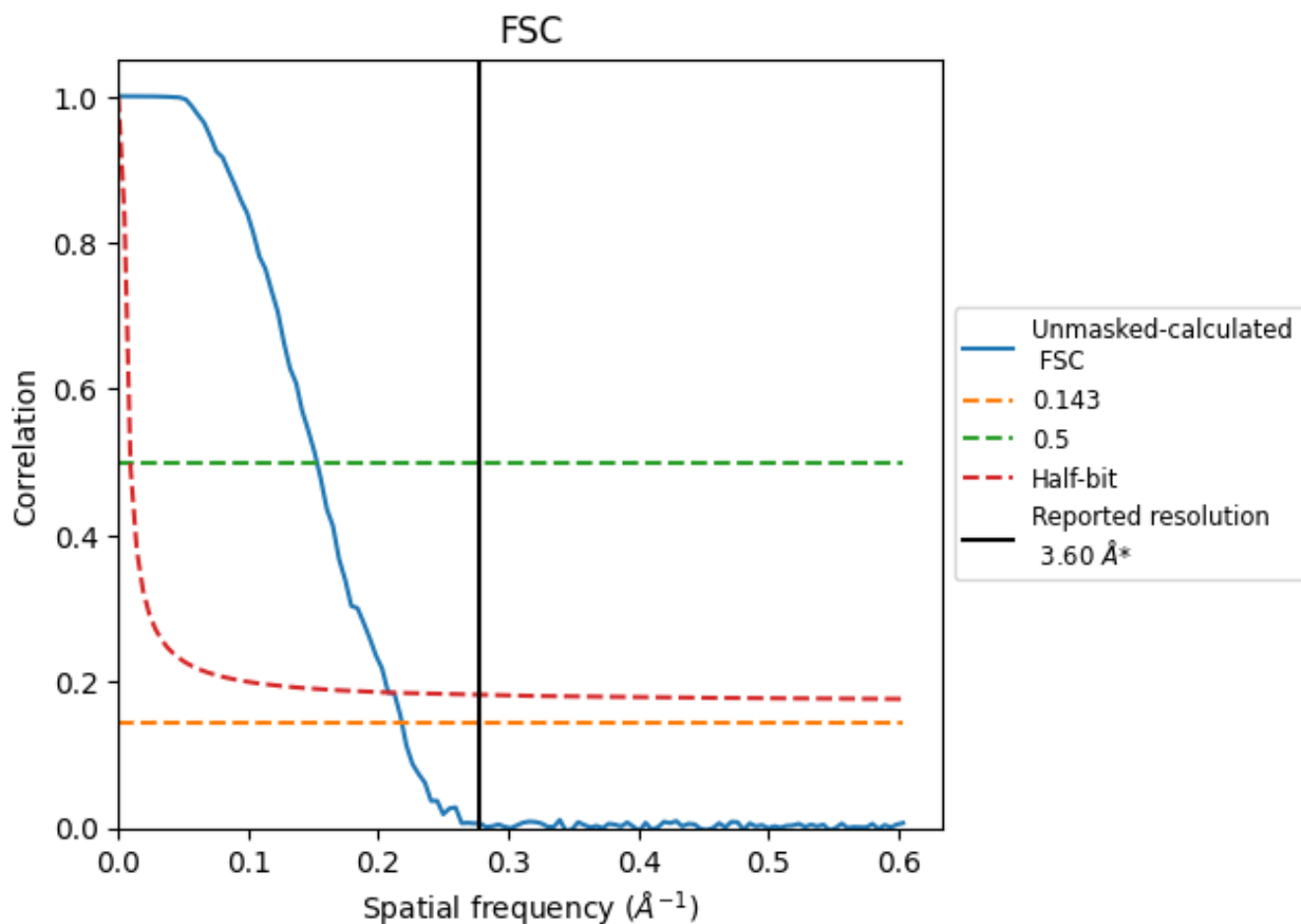


\*Reported resolution corresponds to spatial frequency of 0.278 Å<sup>-1</sup>

## 8 Fourier-Shell correlation [i](#)

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 [i](#)



\*Reported resolution corresponds to spatial frequency of 0.278 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.60	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.58	6.55	4.82

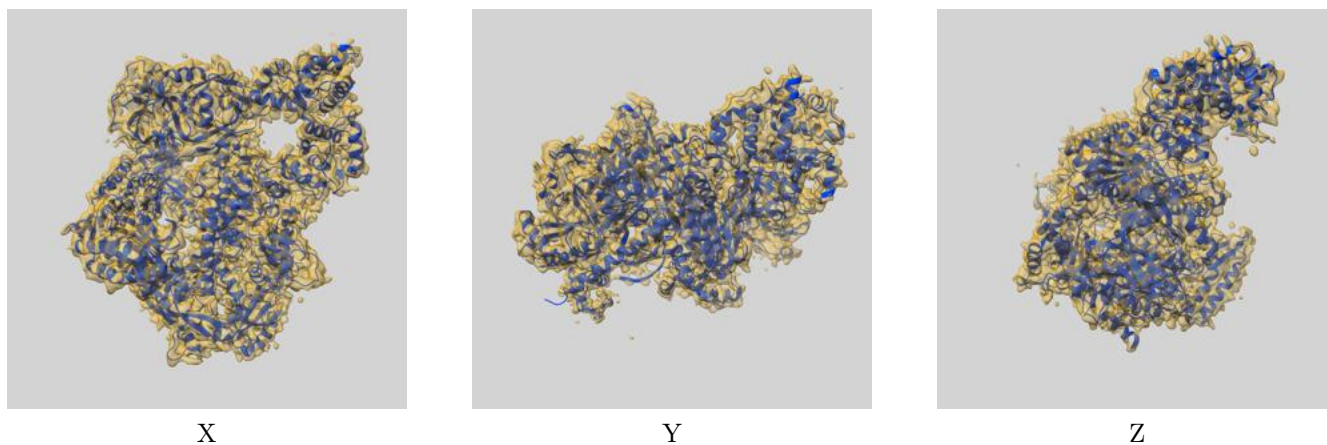
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.58 differs from the reported value 3.6 by more than 10 %



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

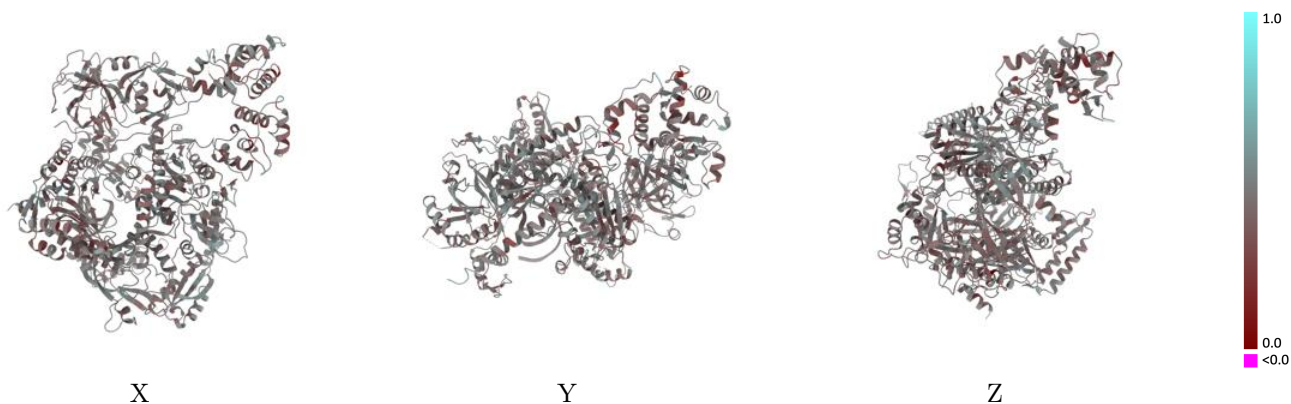
This section contains information regarding the fit between EMDB map EMD-41663 and PDB model 8TW9. Per-residue inclusion information can be found in section [3](#) on page [6](#).

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



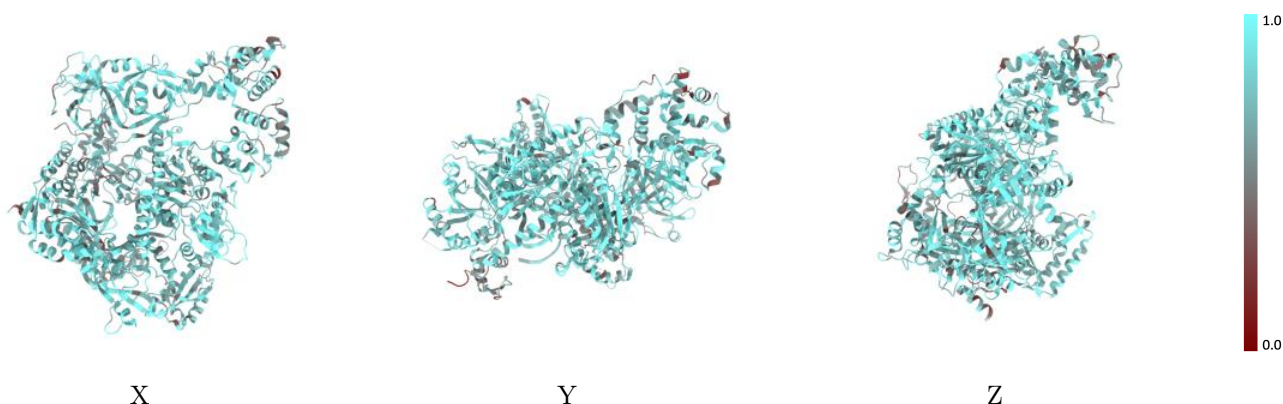
The images above show the 3D surface view of the map at the recommended contour level 0.326 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



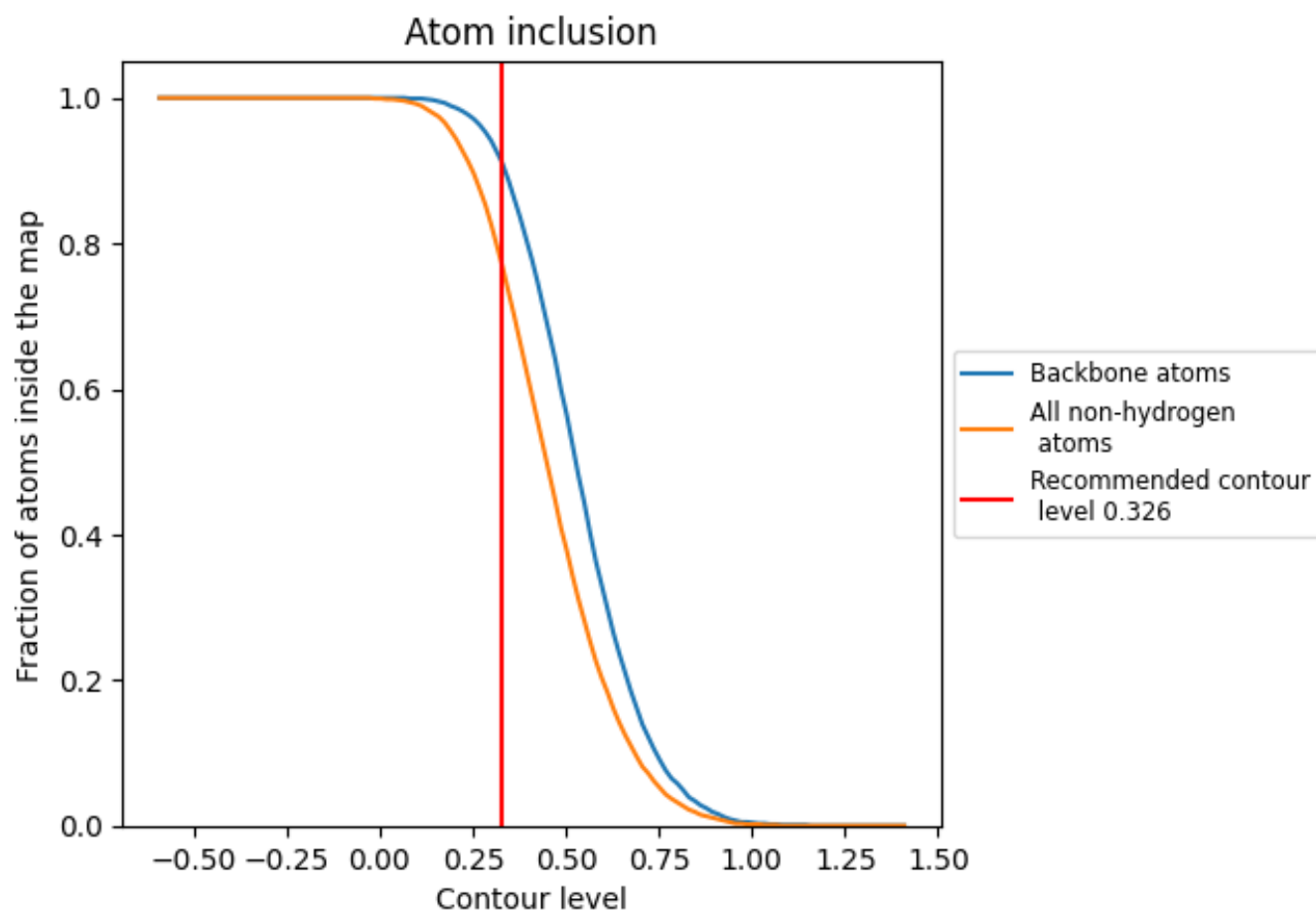
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.326).















## 9.4 Atom inclusion [i](#)



At the recommended contour level, 91% of all backbone atoms, 78% 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 (0.326) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.7760	 0.4380
B	 0.7590	 0.4310
C	 0.7410	 0.4140
D	 0.7900	 0.4270
E	 0.7860	 0.4430
P	 0.7490	 0.4260
T	 0.6600	 0.4240

