wwPDB EM Validation Summary Report (i)

Aug 5, 2026 – 07:34 AM EDT

PDB ID	:	6V93 / pdb_00006v93
EMDB ID	:	EMD-21115
Title	:	Structure of DNA Polymerase Zeta/DNA/dNTP Ternary Complex
Authors	:	Malik, R.; Kopylov, M.; Jain, R.; Ubarrextena-Belandia, I.; Aggarwal, A.K.
Deposited on	:	2019-12-13
Resolution	:	3.10 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*
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:

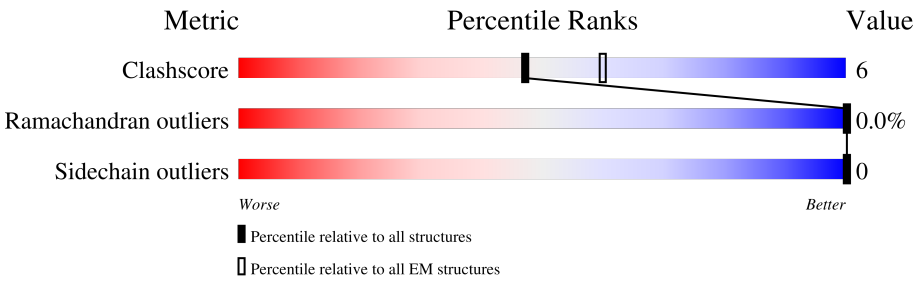
EMDB validation analysis	:	0.0.1.dev133
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.50

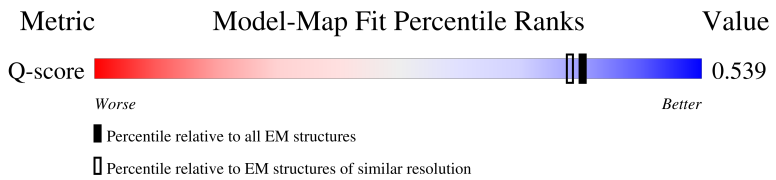
1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.10 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	14724 (2.60 - 3.60)

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

Mol	Chain	Length	Quality of chain
1	A	1538	69% 13% 18%
2	D	245	55% 10% 35%
2	E	245	68% 15% 18%
3	F	494	79% 14% 7%

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Mol	Chain	Length	Quality of chain
4	G	350	31% • 67%
5	P	30	30% 7% 63%
5	T	30	27% 23% 50%

2 Entry composition (i)

There are 9 unique types of molecules in this entry. The entry contains 18105 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 polymerase zeta catalytic subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	1259	9897	6439	1670	1747	41	2	0

There are 34 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-33	MET	-	initiating methionine	UNP P14284
A	-32	ASP	-	expression tag	UNP P14284
A	-31	TYR	-	expression tag	UNP P14284
A	-30	LYS	-	expression tag	UNP P14284
A	-29	ASP	-	expression tag	UNP P14284
A	-28	ASP	-	expression tag	UNP P14284
A	-27	ASP	-	expression tag	UNP P14284
A	-26	ASP	-	expression tag	UNP P14284
A	-25	LYS	-	expression tag	UNP P14284
A	-24	GLY	-	expression tag	UNP P14284
A	-23	ASP	-	expression tag	UNP P14284
A	-22	HIS	-	expression tag	UNP P14284
A	-21	ASN	-	expression tag	UNP P14284
A	-20	HIS	-	expression tag	UNP P14284
A	-19	ARG	-	expression tag	UNP P14284
A	-18	HIS	-	expression tag	UNP P14284
A	-17	LYS	-	expression tag	UNP P14284
A	-16	HIS	-	expression tag	UNP P14284
A	-15	GLY	-	expression tag	UNP P14284
A	-14	ASP	-	expression tag	UNP P14284
A	-13	PRO	-	expression tag	UNP P14284
A	-12	LEU	-	expression tag	UNP P14284
A	-11	GLU	-	expression tag	UNP P14284
A	-10	VAL	-	expression tag	UNP P14284
A	-9	LEU	-	expression tag	UNP P14284
A	-8	PHE	-	expression tag	UNP P14284
A	-7	GLN	-	expression tag	UNP P14284
A	-6	GLY	-	expression tag	UNP P14284

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Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	PRO	-	expression tag	UNP P14284
A	-4	GLY	-	expression tag	UNP P14284
A	-3	GLY	-	expression tag	UNP P14284
A	-2	ASP	-	expression tag	UNP P14284
A	-1	PRO	-	expression tag	UNP P14284
A	0	HIS	-	expression tag	UNP P14284

- Molecule 2 is a protein called DNA polymerase zeta processivity subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	D	159	1286	845	207	230	4	0	0
2	E	202	1660	1079	273	302	6	0	0

- Molecule 3 is a protein called DNA polymerase delta small subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	F	461	3541	2291	587	644	19	0	0

There are 7 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
F	-6	GLY	-	expression tag	UNP P46957
F	-5	PRO	-	expression tag	UNP P46957
F	-4	GLY	-	expression tag	UNP P46957
F	-3	GLY	-	expression tag	UNP P46957
F	-2	ASP	-	expression tag	UNP P46957
F	-1	LEU	-	expression tag	UNP P46957
F	0	HIS	-	expression tag	UNP P46957

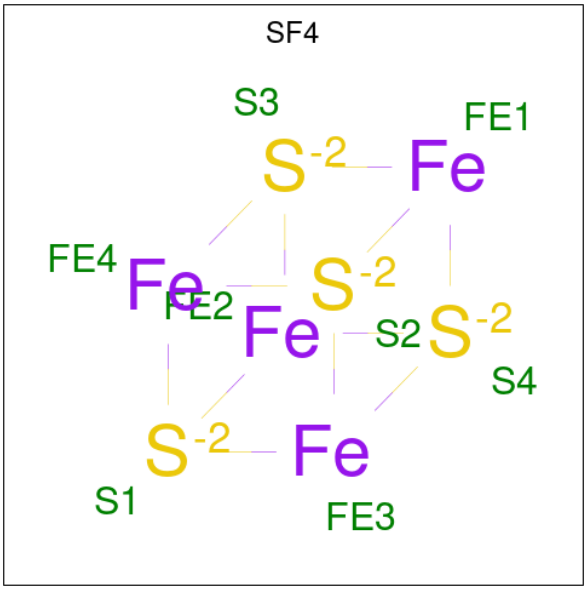
- Molecule 4 is a protein called DNA polymerase delta subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	G	117	929	619	139	163	8	0	0

- Molecule 5 is a DNA chain called DNA.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	P		
5	P	11	212	102	33	66	11	0	0
5	T	15	322	150	69	88	15	0	0

- Molecule 6 is IRON/SULFUR CLUSTER (CCD ID: SF4) (formula: Fe_4S_4) (labeled as "Ligand of Interest" by depositor).

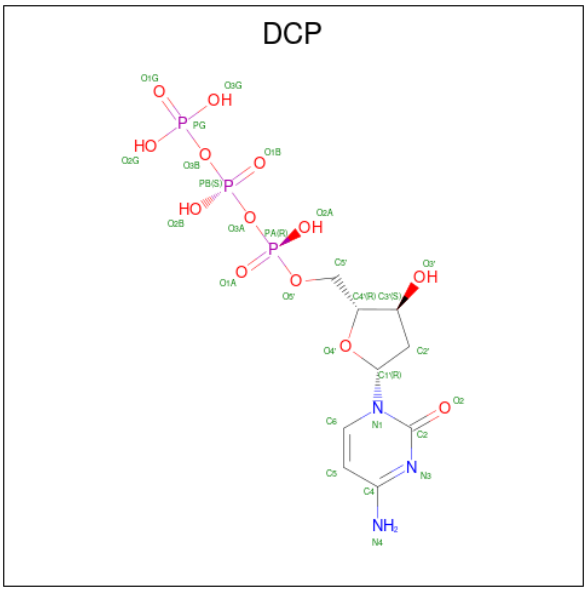


Mol	Chain	Residues	Atoms			AltConf
			Total	Fe	S	
6	A	1	8	4	4	0

- Molecule 7 is CALCIUM ION (CCD ID: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
			Total	Ca	
7	A	2	2	2	0

- Molecule 8 is 2'-DEOXYCYTIDINE-5'-TRIPHOSPHATE (CCD ID: DCP) (formula: $C_9H_{16}N_3O_{13}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
8	A	1	28	9	3	13	3	0

- Molecule 9 is water.

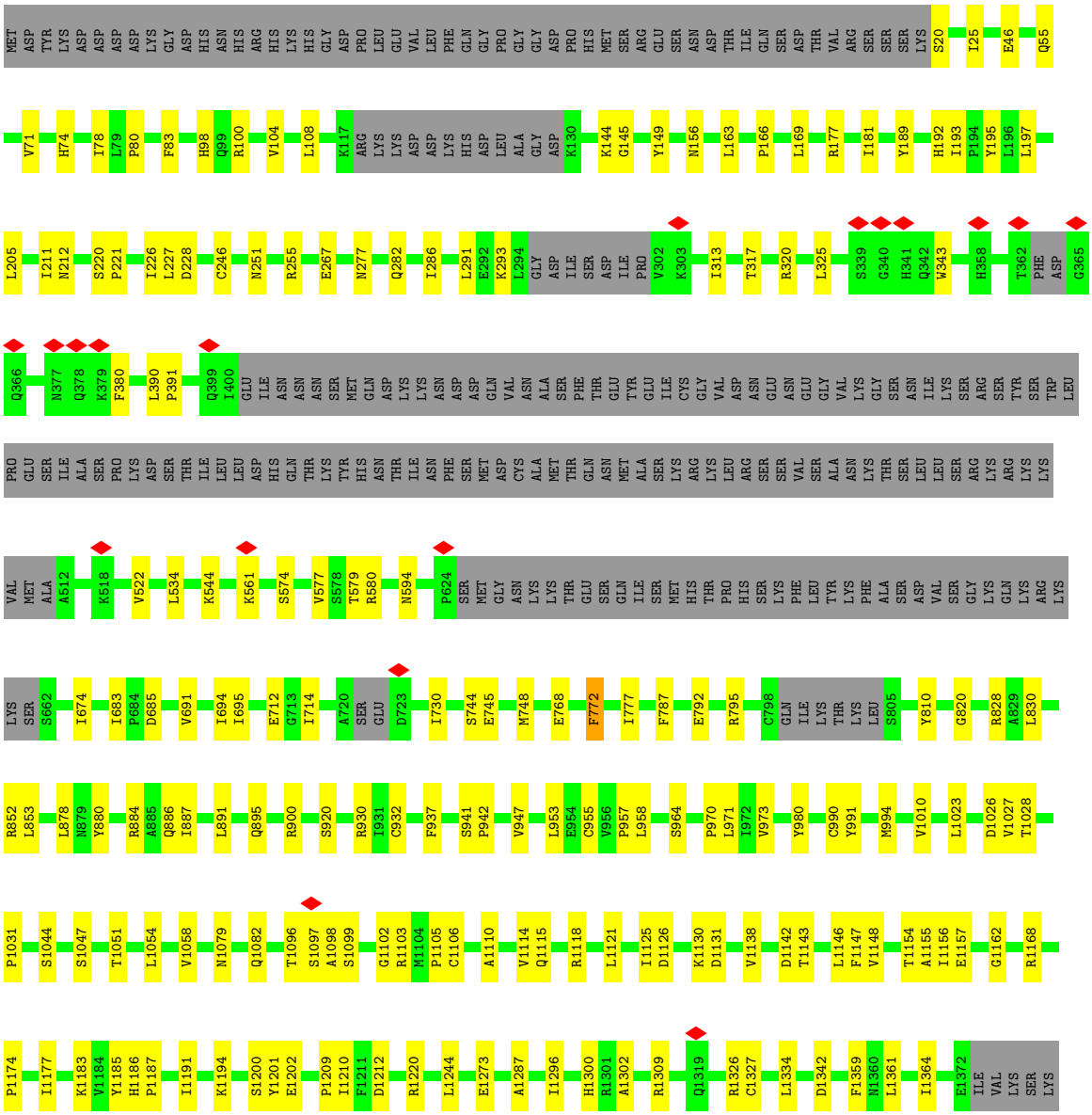
Mol	Chain	Residues	Atoms		AltConf
			Total	O	
9	A	137	137	137	0
9	D	15	15	15	0
9	E	14	14	14	0
9	F	42	42	42	0
9	G	5	5	5	0
9	P	4	4	4	0
9	T	3	3	3	0

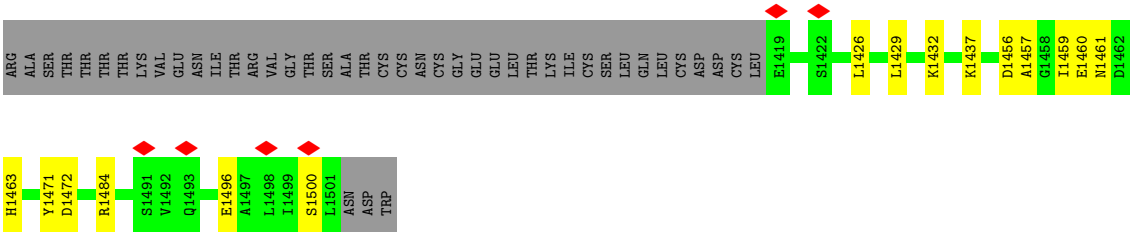
3 Residue-property plots (i)

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 polymerase zeta catalytic subunit

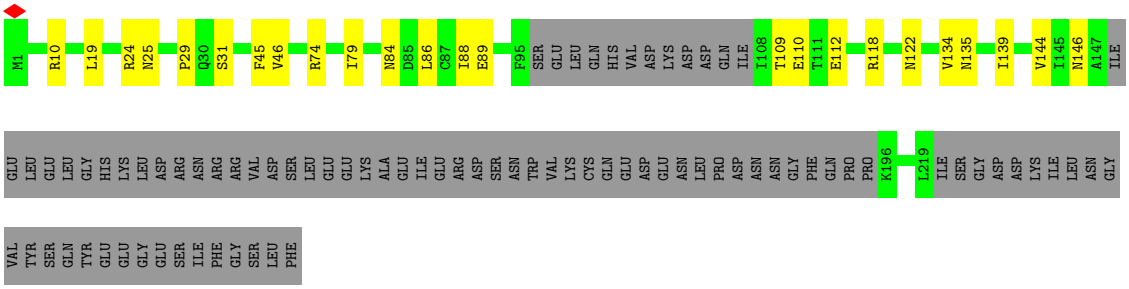
Chain A:





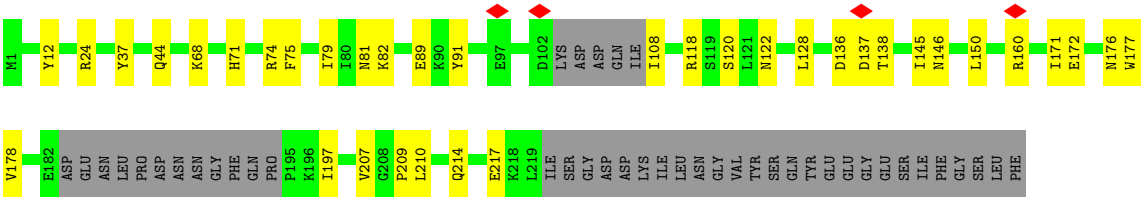
• Molecule 2: DNA polymerase zeta processivity subunit

Chain D:



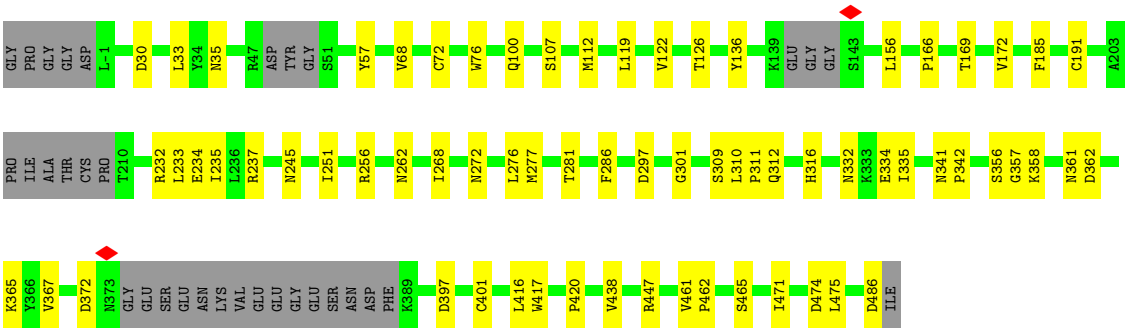
• Molecule 2: DNA polymerase zeta processivity subunit

Chain E:



• Molecule 3: DNA polymerase delta small subunit

Chain F:



• Molecule 4: DNA polymerase delta subunit 3

Chain G:

M1 N10 Y43 Y60 K66 I67 I74 Q77 V117 SER GLU SER SER LYS ILE ILE GLU ARG THR LYS THR LEU GLU GLU LYS SER LYS PRO LEU VAL ARG PRO THR ALA ARG SER LYS THR THR PRO GLU GLU THR THR GLY ARG LYS SER LYS SER LYS ASP MET

GLY LEU ARG SER THR ALA LEU LEU ALA LYS MET LYS LYS ASP ARG ASP ASP LYS GLU THR SER ARG GLN ASN GLU LEU ARG LYS ARG LYS GLU GLU ASN LEU GLN LYS ILE ASN LYS GLN ASN PRO GLU ARG GLU ALA GLN MET LYS GLU LEU ASN ASN LEU LEU PHE VAL GLU ASP LEU

ASP THR GLU GLU VAL ASN GLY GLY SER LYS PRO ASN SER PRO LYS GLU THR ASP SER ASN ASP LYS ASP LYS ASN ASN ASP ASP LEU GLU ASP LEU LEU GLU THR THR ALA GLU ASP SER LEU MET ASP VAL PRO LYS ILE GLN GLN THR LYS PRO SER GLU THR GLU HIS SER LYS GLU

PRO LYS SER GLU GLU PRO SER SER PHE ILE ASP GLU ASP GLY TYR ILE VAL THR LYS ARG PRO ALA THR SER THR PRO PRO ARG LYS PRO SER PRO VAL VAL LYS ARG ALA LEU SER SER SER LYS LYS GLN GLU THR PRO SER SER ASN LYS ARG LEU LYS LYS GLN GLY THR LEU

GLU SER PHE PHE LYS ARG LYS ALA LYS

- Molecule 5: DNA

Chain P: 30% 7% 63%

DT DA DA DT DG DG DT DA DG DG DG DG DA DG DG DG DA DA DT C105 T113 A114 C115

- Molecule 5: DNA

Chain T: 27% 23% 50%

DT A1 G4 G5 G9 G10 G11 G14 G15 DA DA DT DC DC DC DT DC DC DC DC DT DA DC

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	156067	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 ($e^-/Å^2$)	71.63	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	44.020	Depositor
Minimum map value	-17.639	Depositor
Average map value	0.003	Depositor
Map value standard deviation	1.103	Depositor
Recommended contour level	4	Depositor
Map size (Å)	274.752, 274.752, 274.752	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07325, 1.07325, 1.07325	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: DCP, CA, 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	A	0.11	0/10135	0.32	0/13737
2	D	0.10	0/1316	0.29	0/1789
2	E	0.11	0/1696	0.33	0/2300
3	F	0.11	0/3614	0.30	0/4911
4	G	0.10	0/952	0.26	0/1290
5	P	0.17	0/234	0.36	0/355
5	T	0.19	0/364	0.33	0/563
All	All	0.11	0/18311	0.31	0/24945

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
1	A	0	2

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	220	SER	Peptide
1	A	772	PHE	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	9897	0	9647	122	0
2	D	1286	0	1256	18	0
2	E	1660	0	1634	26	0
3	F	3541	0	3451	45	0
4	G	929	0	903	6	0
5	P	212	0	122	2	0
5	T	322	0	168	6	0
6	A	8	0	0	0	0
7	A	2	0	0	0	0
8	A	28	0	12	1	0
9	A	137	0	0	7	0
9	D	15	0	0	3	0
9	E	14	0	0	1	0
9	F	42	0	0	1	0
9	G	5	0	0	0	0
9	P	4	0	0	0	0
9	T	3	0	0	0	0
All	All	18105	0	17193	209	0

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

The worst 5 of 209 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:1098:ALA:HB3	1:A:1105:PRO:HB3	1.60	0.81
1:A:1099:SER:HB3	5:T:5:DG:H5'	1.72	0.71
1:A:108:LEU:HD23	1:A:181:ILE:HG21	1.76	0.68
1:A:1162:GLY:O	9:A:1701:HOH:O	2.12	0.67
2:D:84:ASN:HB3	2:D:86:LEU:HD22	1.78	0.65

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	1243/1538 (81%)	1148 (92%)	94 (8%)	1 (0%)	48	78
2	D	153/245 (62%)	145 (95%)	8 (5%)	0	100	100
2	E	196/245 (80%)	182 (93%)	14 (7%)	0	100	100
3	F	451/494 (91%)	424 (94%)	27 (6%)	0	100	100
4	G	115/350 (33%)	108 (94%)	7 (6%)	0	100	100
All	All	2158/2872 (75%)	2007 (93%)	150 (7%)	1 (0%)	100	100

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	1155	ALA

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	1005/1398 (72%)	1005 (100%)	0	100	100
2	D	137/233 (59%)	137 (100%)	0	100	100
2	E	181/233 (78%)	181 (100%)	0	100	100
3	F	370/449 (82%)	370 (100%)	0	100	100
4	G	95/331 (29%)	95 (100%)	0	100	100
All	All	1788/2644 (68%)	1788 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 25 such sidechains are listed below:

Mol	Chain	Res	Type
2	D	2	ASN
2	E	214	GLN
4	G	77	GLN
2	E	176	ASN
3	F	32	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)

Of 4 ligands modelled in this entry, 2 are monoatomic - leaving 2 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	$\#\|Z\| > 2$
6	SF4	A	1601	1	0,12,12	-	-	-		
8	DCP	A	1604	7	28,29,29	3.86	17 (60%)	41,45,45	0.80	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the

Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	SF4	A	1601	1	-	-	0/6/5/5
8	DCP	A	1604	7	-	3/22/34/34	0/2/2/2

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
8	A	1604	DCP	O4'-C4'	7.61	1.61	1.45
8	A	1604	DCP	C2-N3	7.12	1.50	1.36
8	A	1604	DCP	C3'-C4'	-6.79	1.35	1.53
8	A	1604	DCP	C6-C5	6.76	1.50	1.35
8	A	1604	DCP	C4-N4	5.70	1.47	1.33

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
8	A	1604	DCP	O4'-C4'-C5'-O5'
8	A	1604	DCP	C3'-C4'-C5'-O5'
8	A	1604	DCP	PA-O3A-PB-O2B

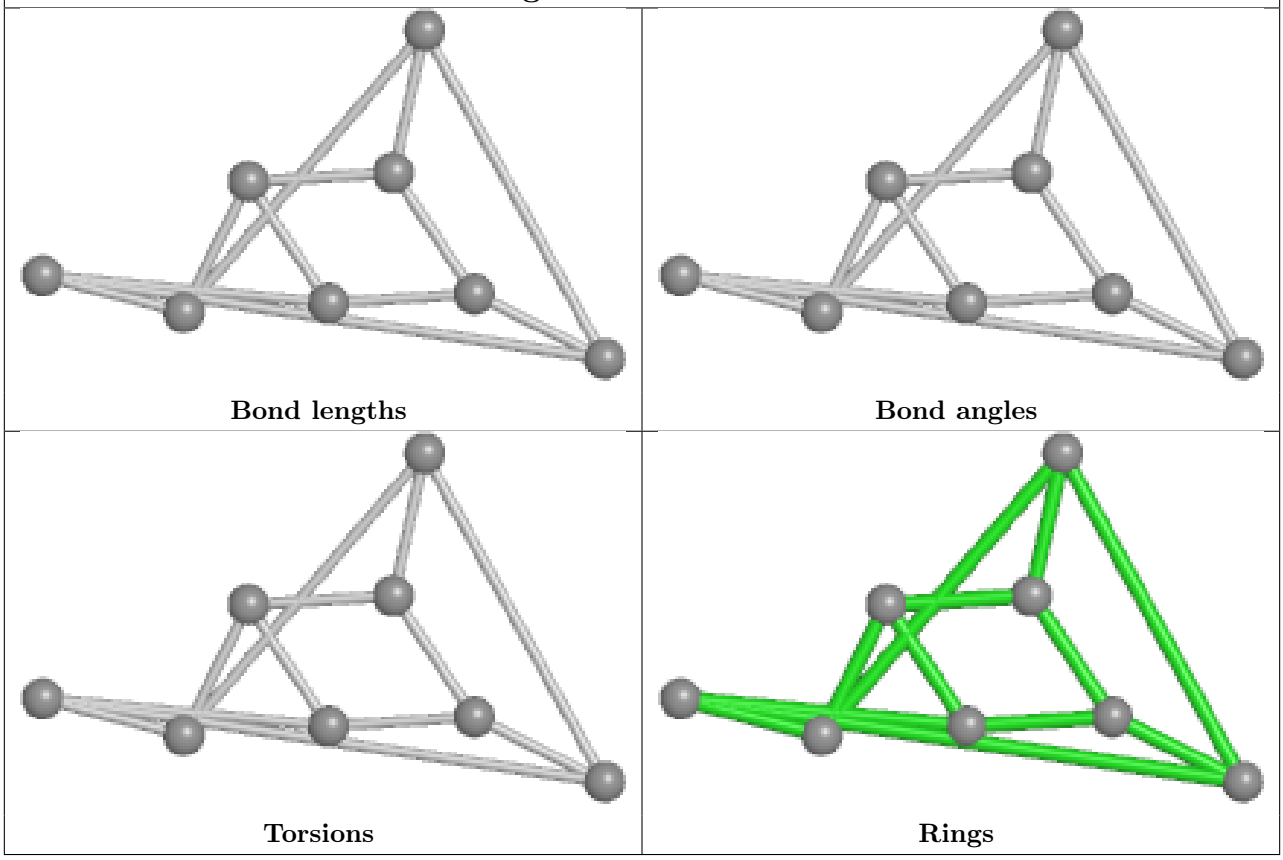
There are no ring outliers.

1 monomer is involved in 1 short contact:

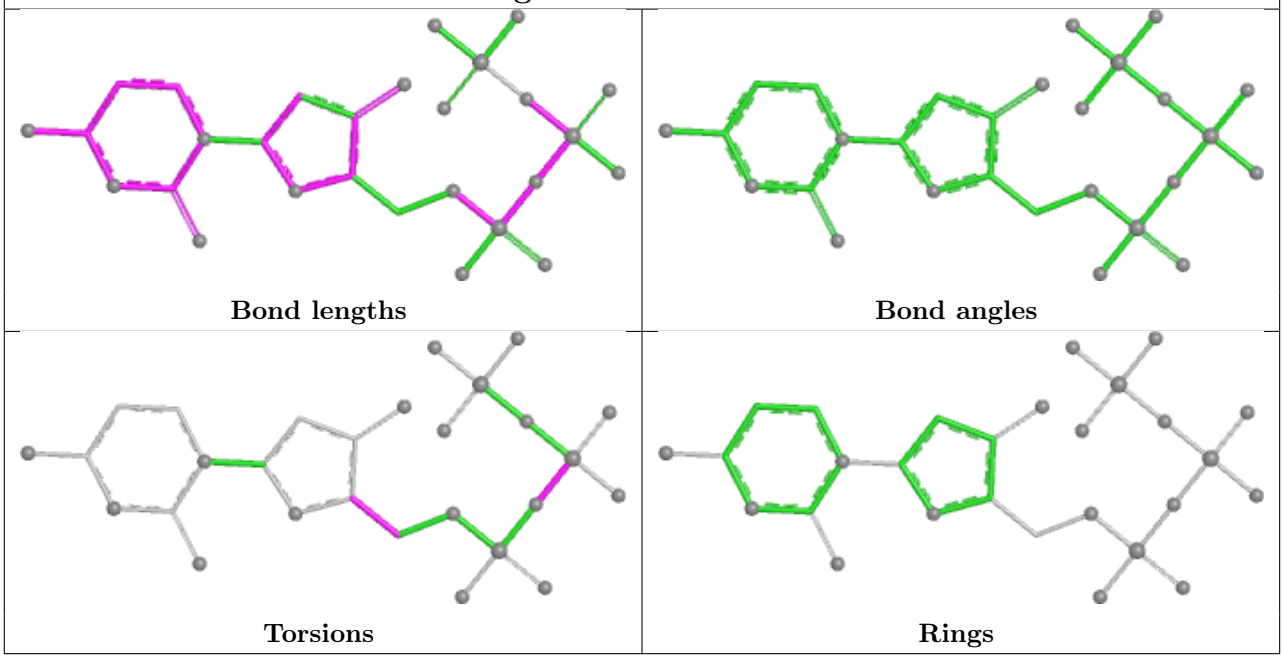
Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	A	1604	DCP	1	0

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 then 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.

Ligand SF4 A 1601



Ligand DCP A 1604



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.

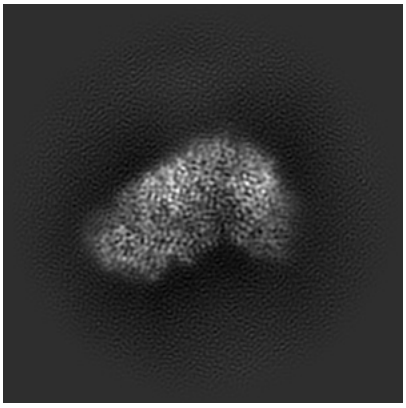
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-21115. These allow visual inspection of the internal detail of the map and identification of artifacts.

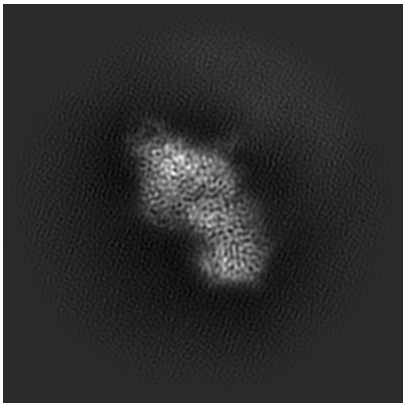
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections (i)

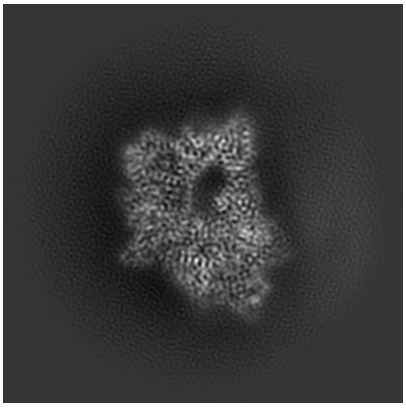
6.1.1 Primary map



X



Y

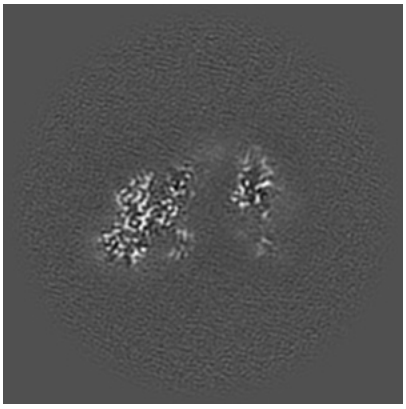


Z

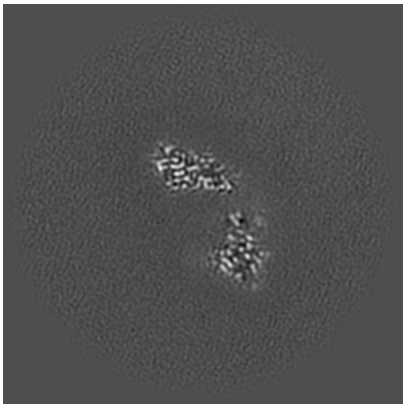
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

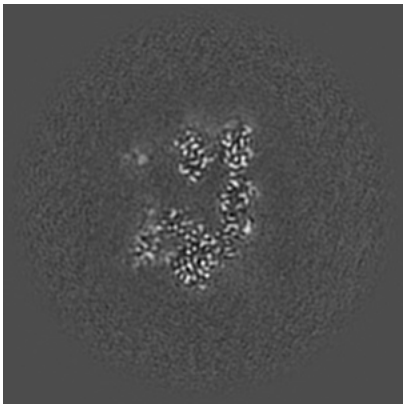
6.2.1 Primary map



X Index: 128



Y Index: 128

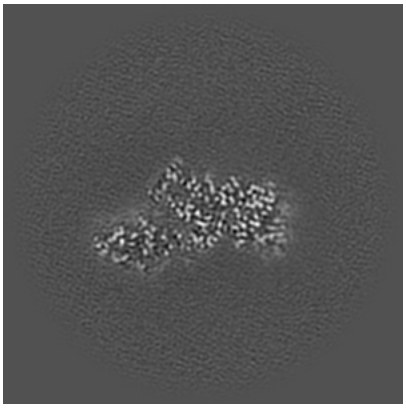


Z Index: 128

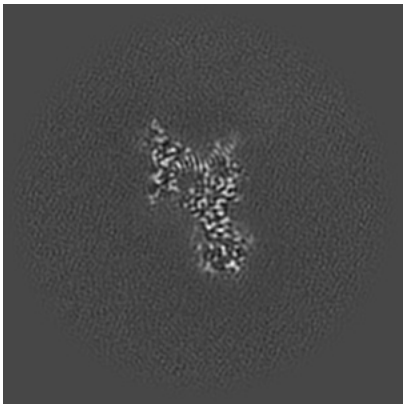
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

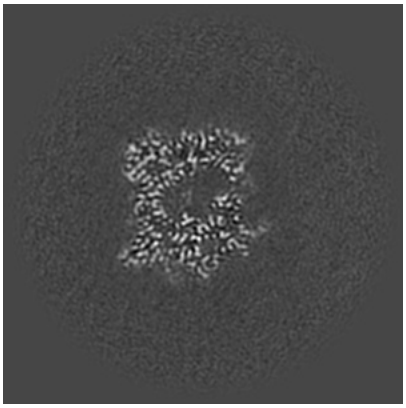
6.3.1 Primary map



X Index: 148



Y Index: 107

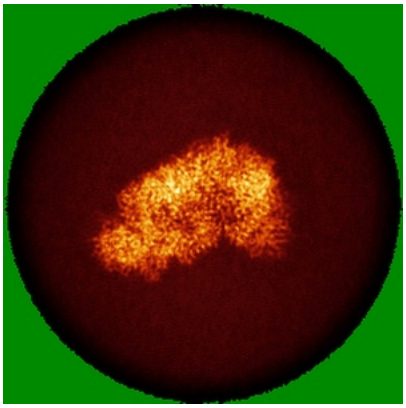


Z Index: 140

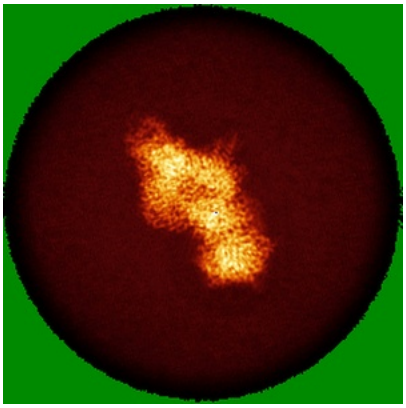
The images above show the largest variance slices of the map in three orthogonal directions.

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

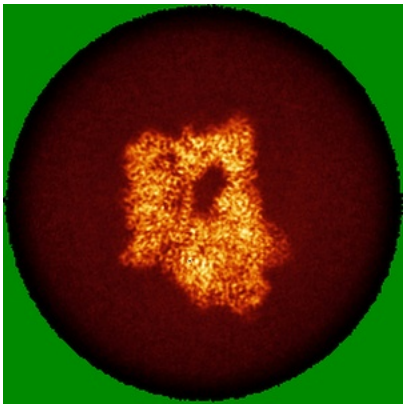
6.4.1 Primary map



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 4.0. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

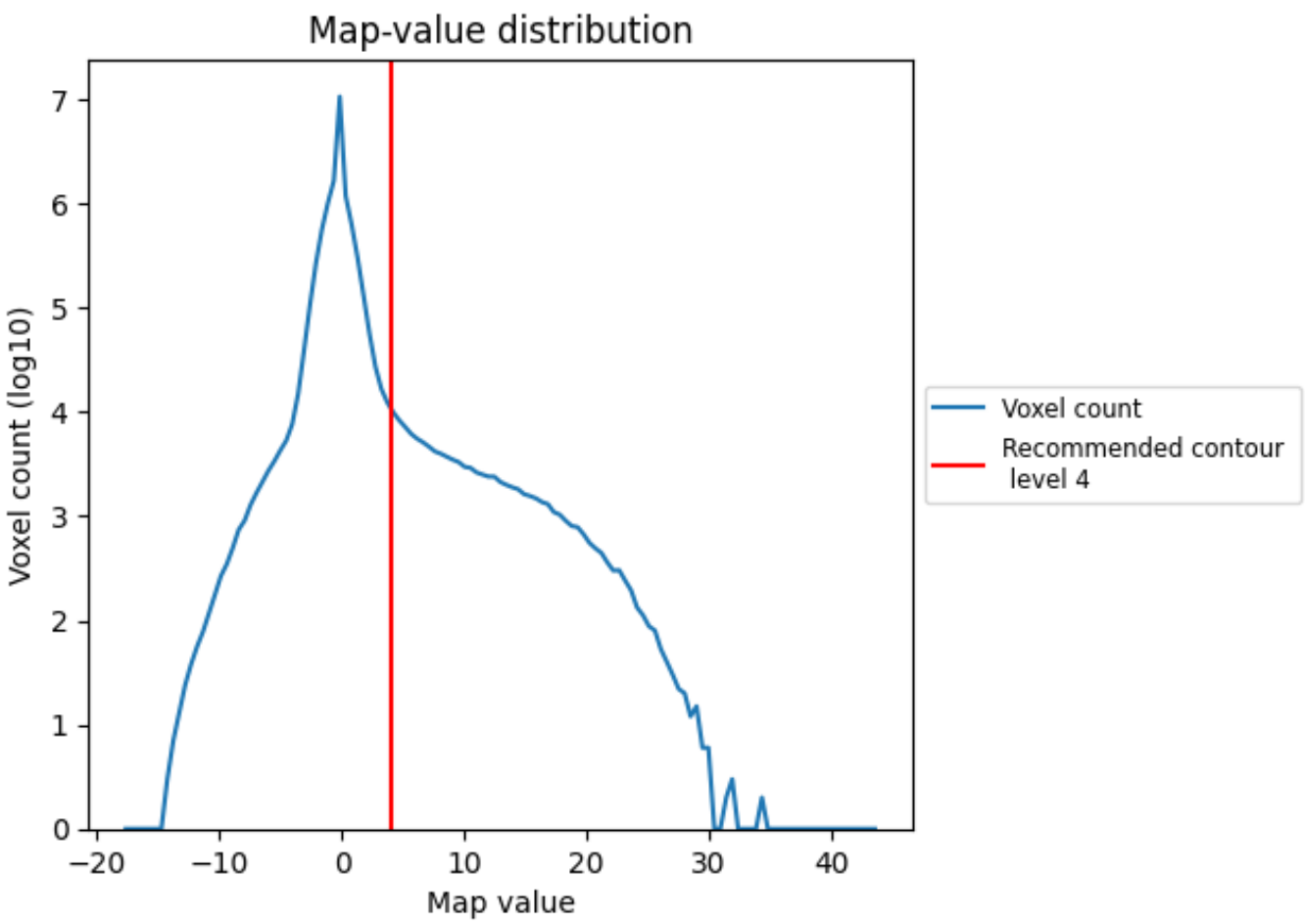
6.6 Mask visualisation (i)

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

7 Map analysis (i)

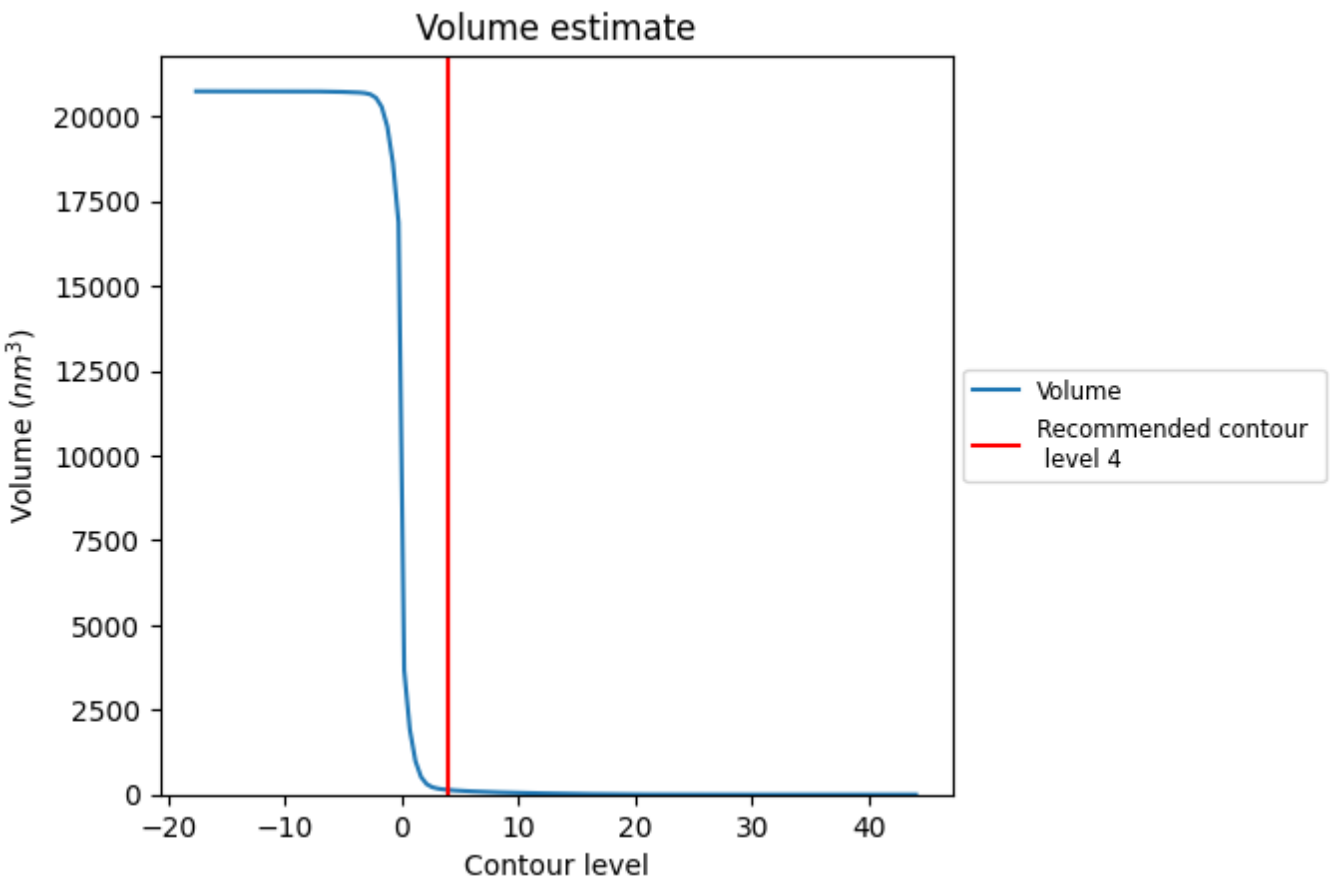
This section contains the results of statistical analysis of the map.

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.

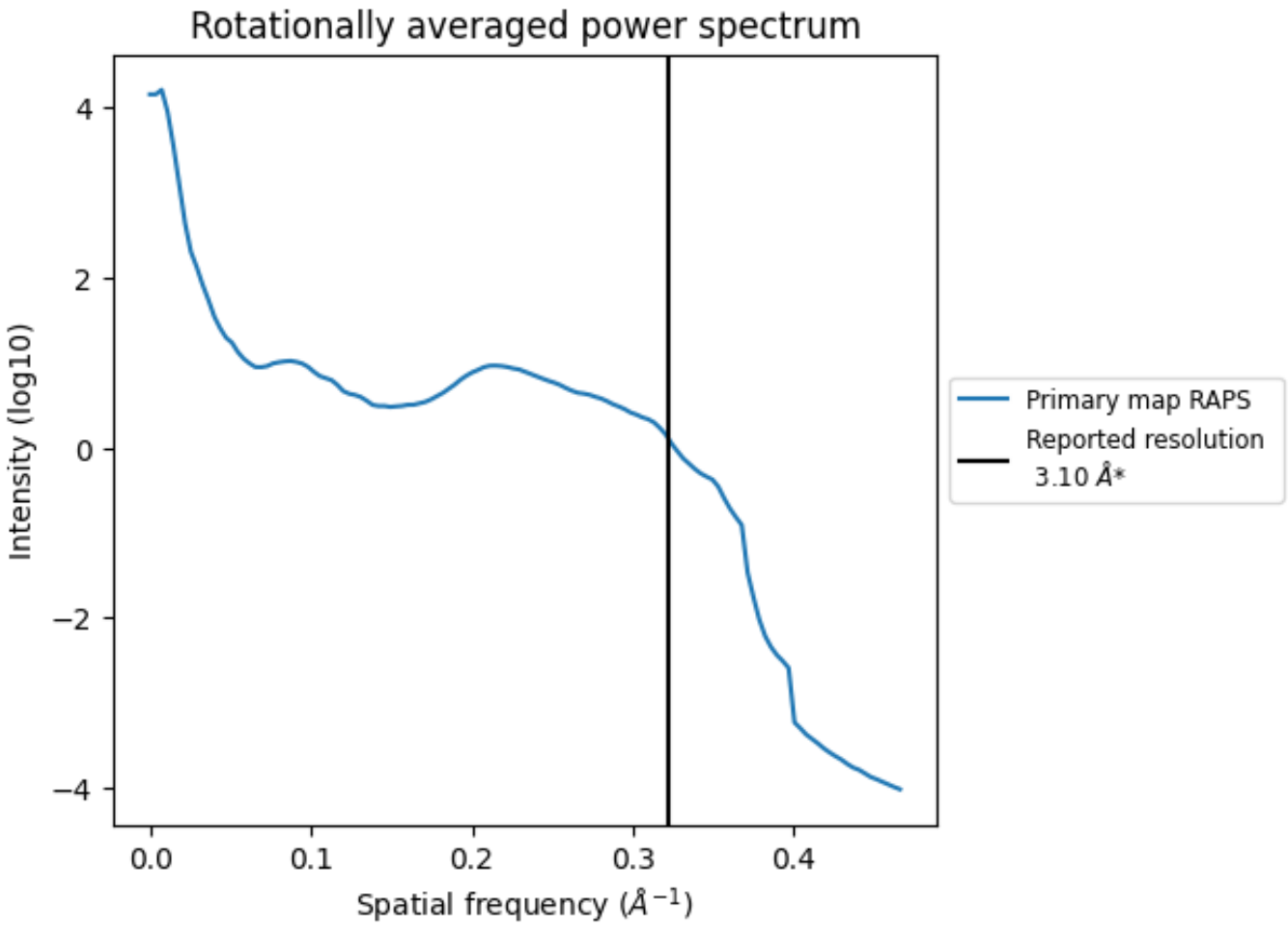
7.2 Volume estimate (i)



The volume at the recommended contour level is 137 nm^3; this corresponds to an approximate mass of 123 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 0.323 Å^{-1}

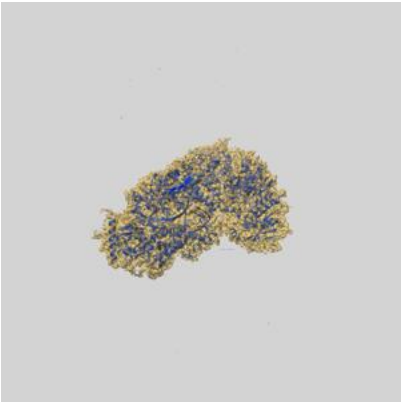
8 Fourier-Shell correlation (i)

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

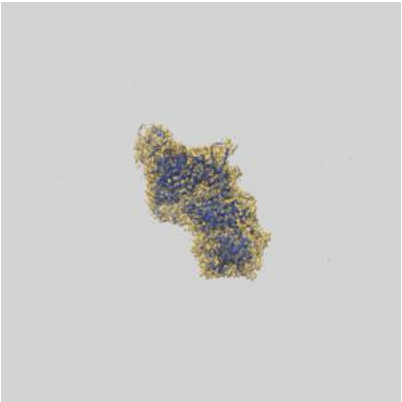
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-21115 and PDB model 6V93. Per-residue inclusion information can be found in section 3 on page 8.

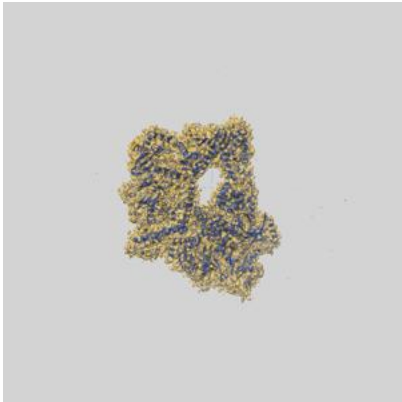
9.1 Map-model overlay (i)



X



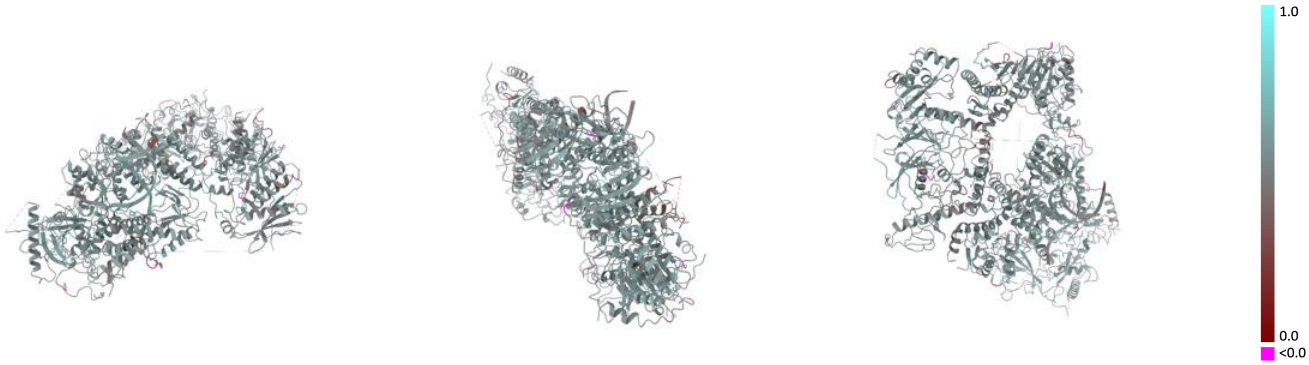
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 4.0 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.

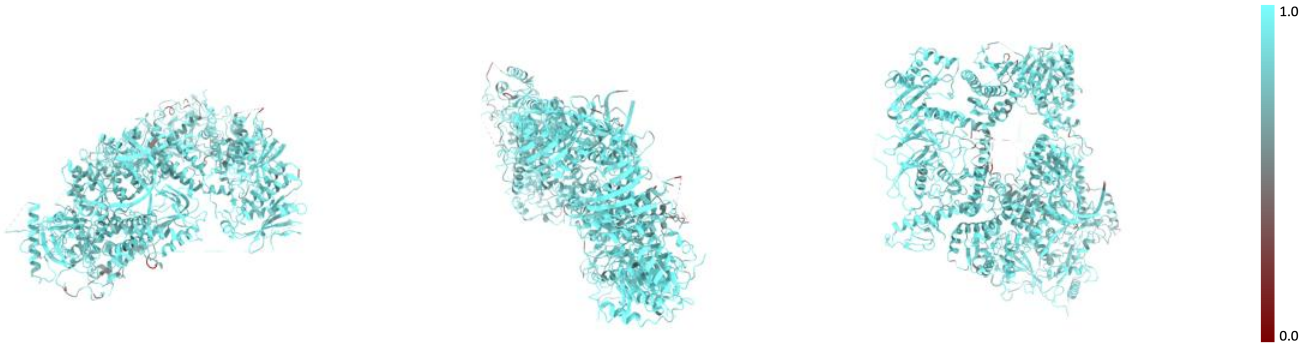
9.2 Q-score mapped to coordinate model (i)



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.

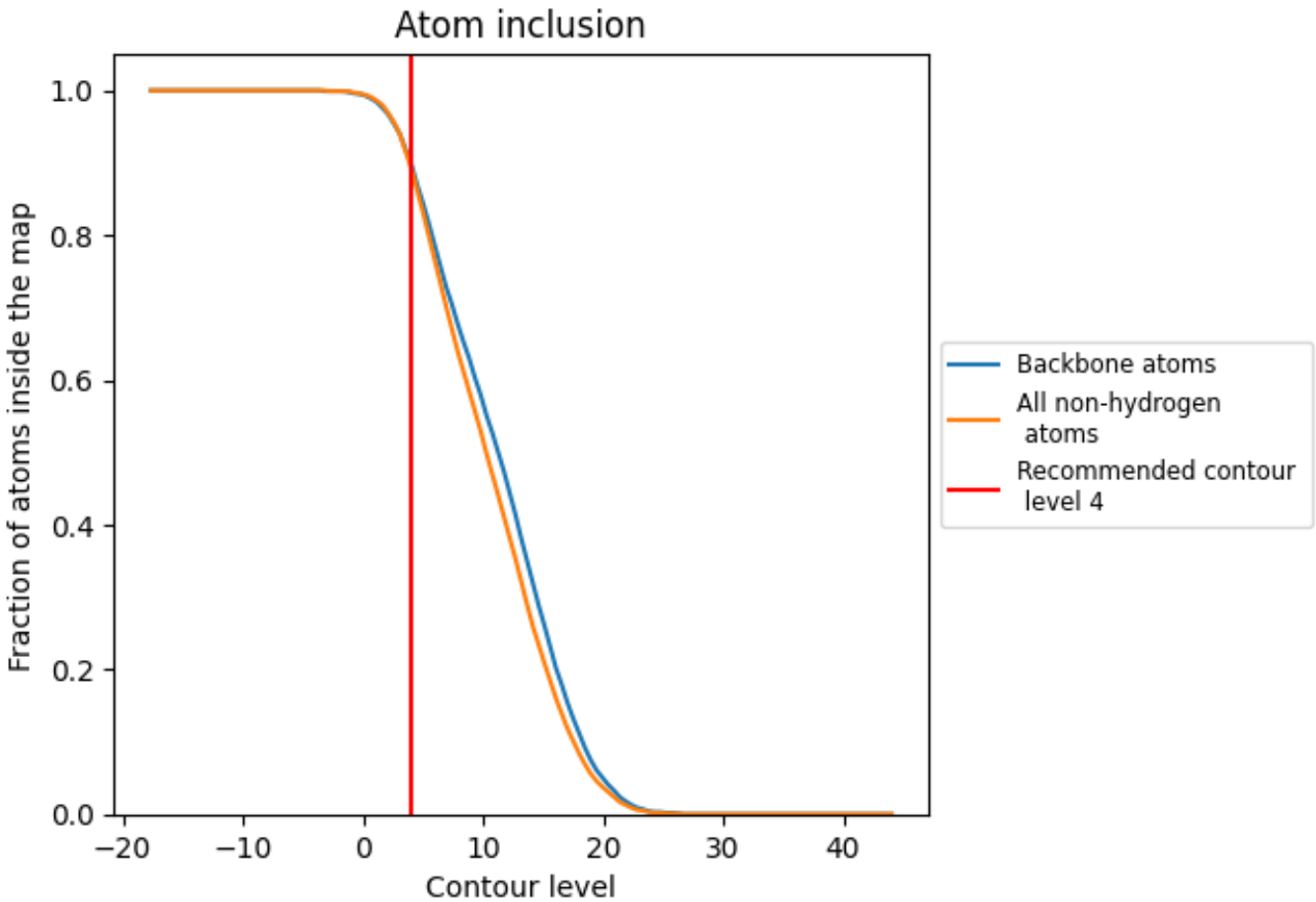
9.3 Atom inclusion mapped to coordinate model (i)



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 (4).

9.4 Atom inclusion (i)



At the recommended contour level, 90% of all backbone atoms, 89% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (4) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8940	0.5390
A	0.8810	0.5430
D	0.9000	0.5320
E	0.8900	0.5310
F	0.9170	0.5320
G	0.9440	0.5450
P	0.9100	0.5480
T	0.9410	0.5350