



# wwPDB EM Validation Summary Report ⓘ

Nov 21, 2024 – 03:41 PM EST

PDB ID : 8W0I  
EMDB ID : EMD-43710  
Title : Cryo-EM structure of the human MCM2-7 heterohexamer  
Authors : Yang, R.; Hunker, O.; Bleichert, F.  
Deposited on : 2024-02-13  
Resolution : 3.50 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:

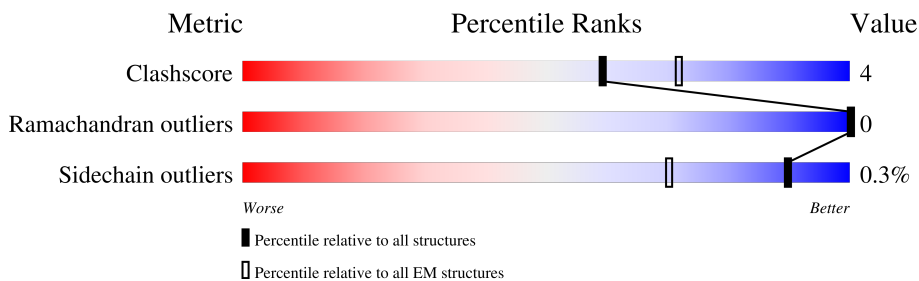
EMDB validation analysis : 0.0.1.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal 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 3.50 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	2	904	
2	3	810	
3	4	866	
4	5	734	
5	6	821	
6	7	719	

## 2 Entry composition

There are 10 unique types of molecules in this entry. The entry contains 56930 atoms, of which 28549 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 replication licensing factor MCM2.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	2	598	9471	2980	4739	844	879	29	0	0

- Molecule 2 is a protein called DNA replication licensing factor MCM3.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
2	3	594	9354	2916	4691	821	900	26	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
3	-1	SER	-	expression tag	UNP P25205
3	0	ASN	-	expression tag	UNP P25205
3	1	ALA	-	expression tag	UNP P25205

- Molecule 3 is a protein called DNA replication licensing factor MCM4.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
3	4	580	9311	2928	4675	822	860	26	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
4	-2	SER	-	expression tag	UNP P33991
4	-1	ASN	-	expression tag	UNP P33991
4	0	ALA	-	expression tag	UNP P33991
4	650	MET	LEU	variant	UNP P33991

- Molecule 4 is a protein called DNA replication licensing factor MCM5.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
4	5	587	9327	2900	4720	815	857	35	0	0

- Molecule 5 is a protein called DNA replication licensing factor MCM6.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
5	6	591	9497	2982	4760	836	893	26	0	0

- Molecule 6 is a protein called DNA replication licensing factor MCM7.

Mol	Chain	Residues	Atoms					AltConf	Trace	
			Total	C	H	N	O			S
6	7	607	9749	3044	4904	860	910	31	0	0

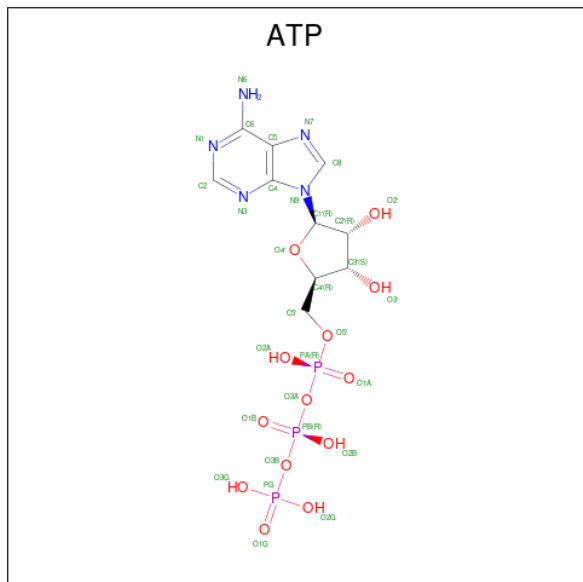
- Molecule 7 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		AltConf
7	2	1	Total	Zn	0
			1	1	
7	4	1	Total	Zn	0
			1	1	
7	5	1	Total	Zn	0
			1	1	
7	6	1	Total	Zn	0
			1	1	
7	7	1	Total	Zn	0
			1	1	

- Molecule 8 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

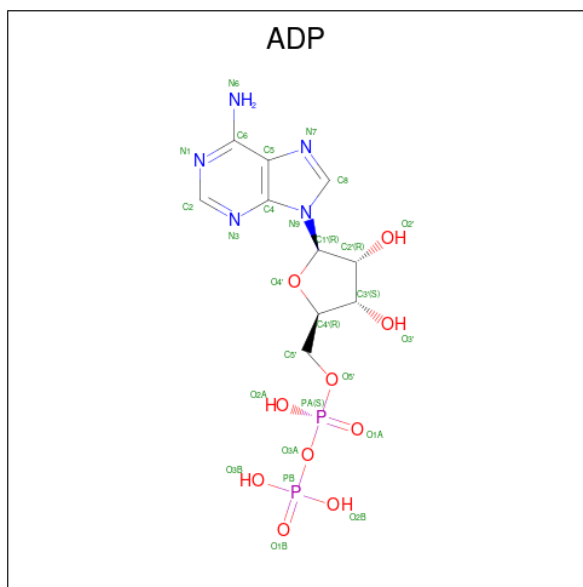
Mol	Chain	Residues	Atoms		AltConf
8	2	1	Total	Mg	0
			1	1	
8	3	1	Total	Mg	0
			1	1	
8	4	1	Total	Mg	0
			1	1	
8	6	1	Total	Mg	0
			1	1	
8	7	1	Total	Mg	0
			1	1	

- Molecule 9 is ADENOSINE-5'-TRIPHOSPHATE (three-letter code: ATP) (formula:  $C_{10}H_{16}N_5O_{13}P_3$ ).



Mol	Chain	Residues	Atoms					AltConf	
			Total	C	H	N	O		P
9	2	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
9	4	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
9	6	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	
9	7	1	Total	C	H	N	O	P	0
			43	10	12	5	13	3	

- Molecule 10 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula:  $C_{10}H_{15}N_5O_{10}P_2$ ).

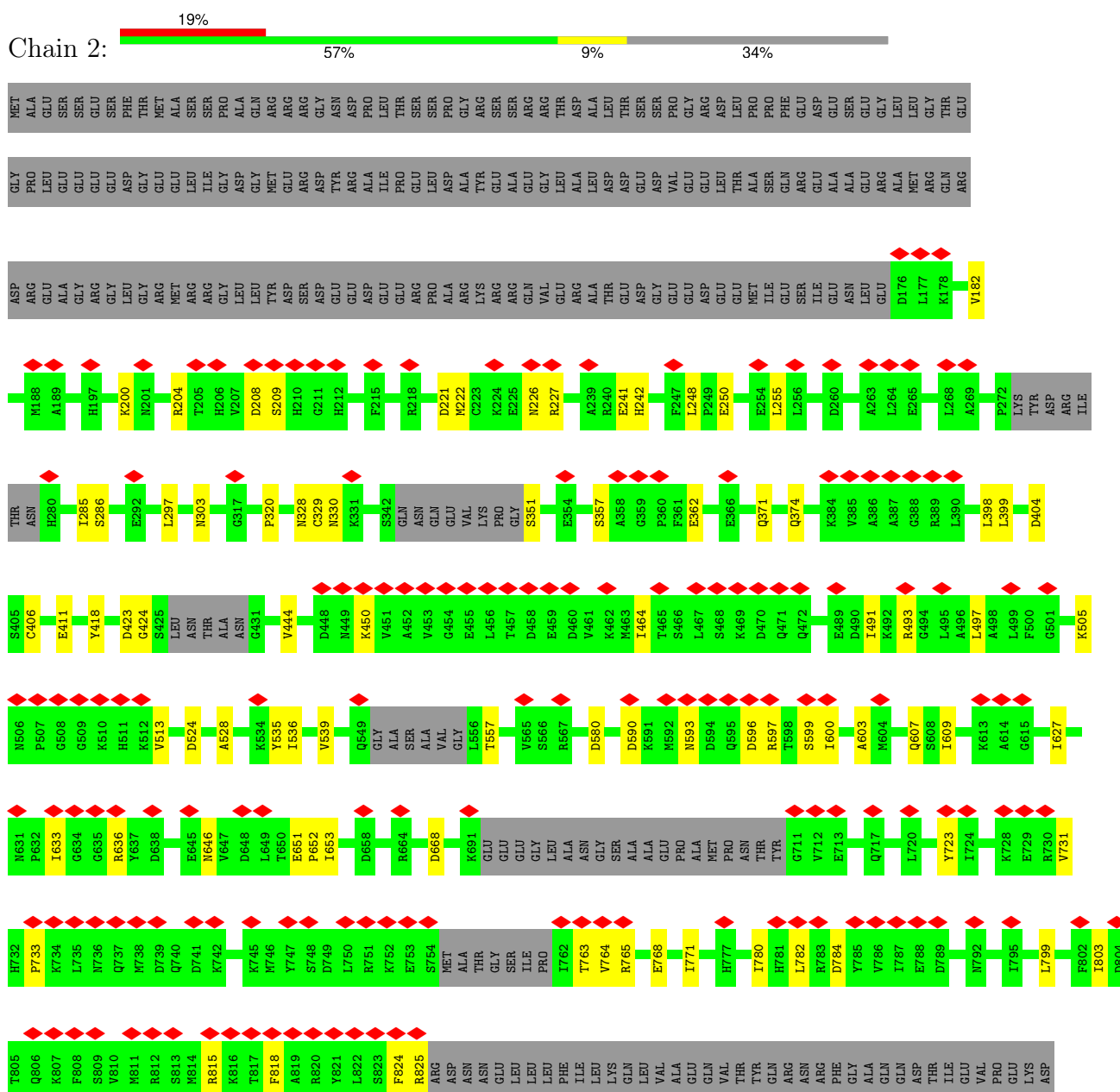


Mol	Chain	Residues	Atoms					AltConf	
			Total	C	H	N	O		P
10	3	1	39	10	12	5	10	2	0

### 3 Residue-property plots

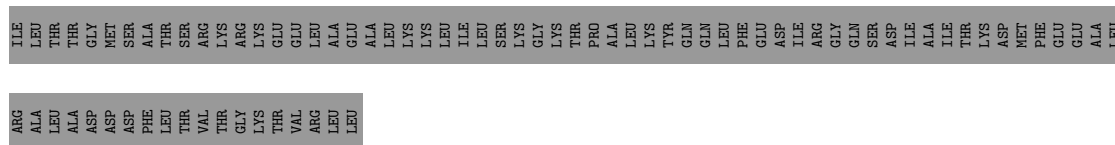
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion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

- Molecule 1: DNA replication licensing factor MCM2

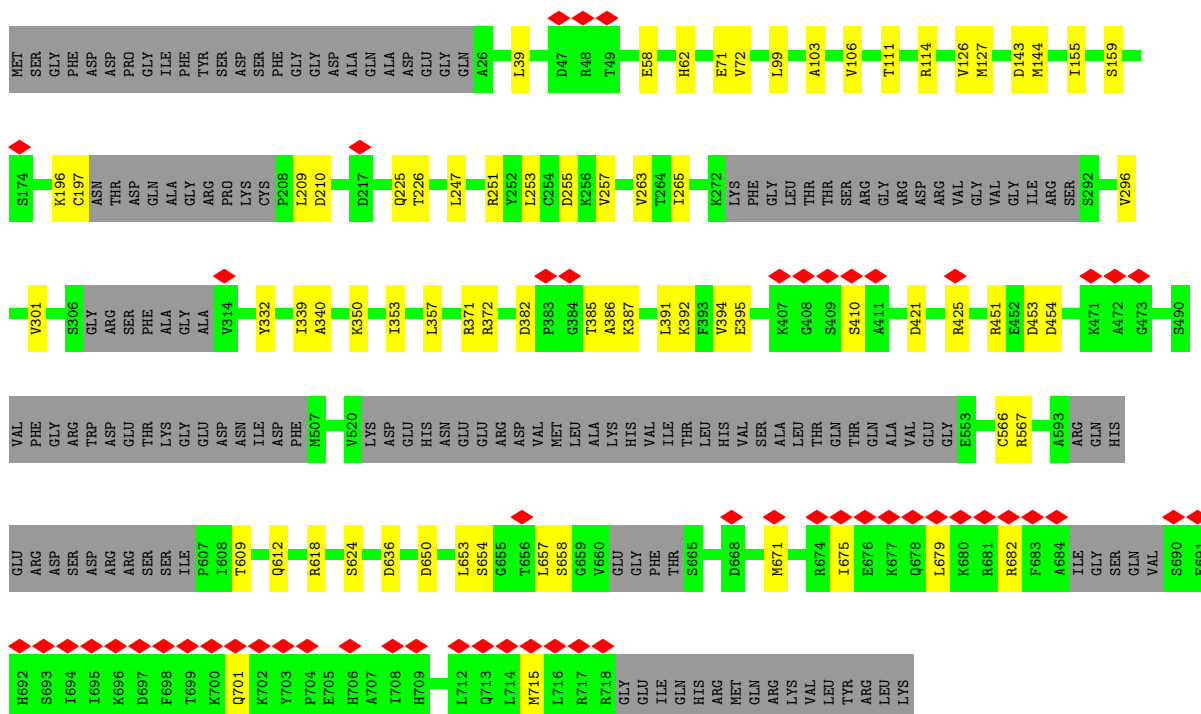




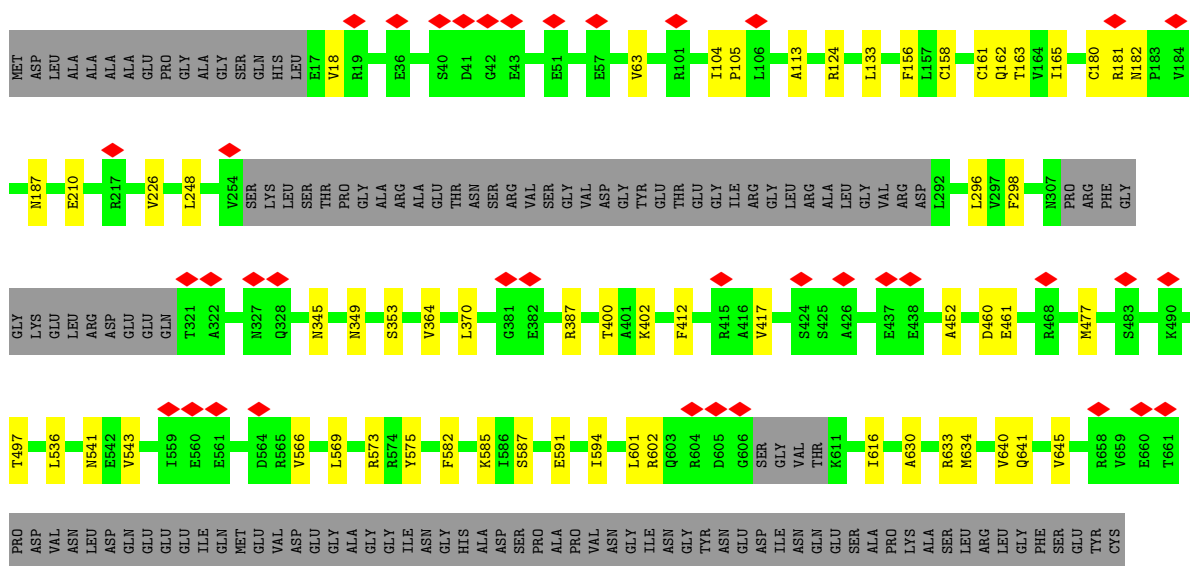




● Molecule 4: DNA replication licensing factor MCM5



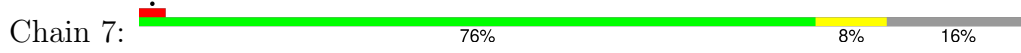
● Molecule 5: DNA replication licensing factor MCM6



ARG  
ILE  
SER  
ASN  
HIS  
LEU  
ILE  
VAL  
LEU  
HIS  
LEU  
ARG  
GLN  
LYS  
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GLU  
GLY  
GLU  
GLU  
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SER  
ASP  
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ALA  
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LYS  
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TYR  
ARG  
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GLU  
VAL  
ASP  
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TRP  
TRP  
TYR  
VAL  
LEU  
LYS  
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SER  
GLU  
ASP  
SER  
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GLN  
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TYR  
GLU  
GLU  
ASP  
VAL  
LEU  
TRP  
VAL  
ASN  
ASN  
TYR  
LEU  
LEU  
GLU  
ASP

● Molecule 6: DNA replication licensing factor MCM7



MET  
ALA  
I3  
D24  
E25  
L26  
G27  
E92  
V98  
Y102  
I103  
E104  
H105  
S113  
ARG  
ASP  
PRO  
GLY  
M118  
V119  
M131  
I149  
V157  
C184  
D186  
C211  
R215  
L222  
Q223  
T224  
Q233  
I253  
R263  
R282  
THR  
GLY  
PHE  
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GLN  
V288  
T296  
N307

LYS  
SER  
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ASP  
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SER  
GLY  
ALA  
GLY  
GLU  
L319  
T320  
R321  
E322  
E323  
L324  
R325  
Q326  
I327  
E330  
V350  
L354  
L355  
L356  
C361  
V362  
D363  
Q364  
S365  
PRO  
ARG  
GLY  
MET  
K370  
I371  
R372  
G373  
N374  
L379  
V385  
A386  
K387  
R396  
I397  
A398  
S401  
G406  
ARG  
GLY  
SER

SER  
GLY  
VAL  
G413  
R420  
ASP  
SER  
VAL  
SER  
GLY  
GLU  
L427  
E430  
Q439  
E463  
Q464  
A470  
R471  
A472  
G473  
I474  
L475  
T476  
T477  
R481  
C482  
S483  
M489  
Y492  
M496  
N504  
I505  
Q506  
L518  
W519  
D523  
R545  
Q546  
R560  
I563  
R567  
P574

A578  
T582  
A583  
V586  
R596  
R611  
T614  
A615  
L616  
V624  
S640  
L645  
GLY  
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THR  
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VAL

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	203444	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 ( $e^-/\text{\AA}^2$ )	50.96	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.990	Depositor
Minimum map value	-0.300	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.026	Depositor
Recommended contour level	0.25	Depositor
Map size ( $\text{\AA}$ )	499.2, 499.2, 499.2	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	0.832, 0.832, 0.832	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: ZN, ADP, ATP, 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	2	0.25	0/4818	0.48	0/6501
2	3	0.28	0/4731	0.49	0/6385
3	4	0.26	0/4718	0.49	0/6372
4	5	0.26	0/4672	0.50	0/6271
5	6	0.27	0/4814	0.51	0/6494
6	7	0.27	0/4917	0.50	0/6634
All	All	0.27	0/28670	0.49	0/38657

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [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	2	4732	4739	4739	52	0
2	3	4663	4691	4691	31	0
3	4	4636	4675	4675	56	0
4	5	4607	4720	4719	47	0
5	6	4737	4760	4759	36	0
6	7	4845	4904	4904	38	0
7	2	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
7	4	1	0	0	0	0
7	5	1	0	0	0	0
7	6	1	0	0	0	0
7	7	1	0	0	0	0
8	2	1	0	0	0	0
8	3	1	0	0	0	0
8	4	1	0	0	0	0
8	6	1	0	0	0	0
8	7	1	0	0	0	0
9	2	31	12	12	1	0
9	4	31	12	12	1	0
9	6	31	12	12	1	0
9	7	31	12	12	1	0
10	3	27	12	12	1	0
All	All	28381	28549	28547	249	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 4.

The worst 5 of 249 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)
4:5:382:ASP:O	4:5:387:LYS:NZ	2.07	0.88
3:4:710:LEU:HD13	3:4:738:ILE:HG22	1.60	0.83
2:3:351:LYS:NZ	10:3:1002:ADP:O1B	2.13	0.81
5:6:156:PHE:O	5:6:165:ILE:N	2.21	0.73
3:4:503:GLU:N	3:4:503:GLU:OE1	2.21	0.72

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	2	584/904 (65%)	542 (93%)	42 (7%)	0	100	100
2	3	584/810 (72%)	555 (95%)	29 (5%)	0	100	100
3	4	568/866 (66%)	545 (96%)	23 (4%)	0	100	100
4	5	569/734 (78%)	551 (97%)	18 (3%)	0	100	100
5	6	583/821 (71%)	566 (97%)	17 (3%)	0	100	100
6	7	593/719 (82%)	570 (96%)	23 (4%)	0	100	100
All	All	3481/4854 (72%)	3329 (96%)	152 (4%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	2	524/781 (67%)	524 (100%)	0	100	100
2	3	513/708 (72%)	510 (99%)	3 (1%)	84	91
3	4	515/755 (68%)	512 (99%)	3 (1%)	84	91
4	5	504/625 (81%)	503 (100%)	1 (0%)	92	97
5	6	530/724 (73%)	530 (100%)	0	100	100
6	7	530/619 (86%)	528 (100%)	2 (0%)	89	95
All	All	3116/4212 (74%)	3107 (100%)	9 (0%)	90	96

5 of 9 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
6	7	102	TYR
6	7	105	HIS
3	4	229	TYR
3	4	255	GLU
3	4	509	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

### 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 15 ligands modelled in this entry, 10 are monoatomic - leaving 5 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	ADP	3	1002	8	24,29,29	0.85	0	29,45,45	1.25	2 (6%)
9	ATP	2	1002	8	28,33,33	0.73	0	34,52,52	1.42	3 (8%)
9	ATP	6	1002	8	28,33,33	0.76	0	34,52,52	1.24	2 (5%)
9	ATP	7	1002	8	28,33,33	0.82	1 (3%)	34,52,52	1.42	2 (5%)
9	ATP	4	1002	8	28,33,33	0.66	0	34,52,52	0.91	1 (2%)

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	ADP	3	1002	8	-	2/12/32/32	0/3/3/3
9	ATP	2	1002	8	-	4/18/38/38	0/3/3/3
9	ATP	6	1002	8	-	4/18/38/38	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
9	ATP	7	1002	8	-	5/18/38/38	0/3/3/3
9	ATP	4	1002	8	-	3/18/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
9	7	1002	ATP	PB-O3B	-2.59	1.56	1.59

The worst 5 of 10 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
9	7	1002	ATP	C4'-O4'-C1'	-6.55	103.93	109.92
9	2	1002	ATP	C4'-O4'-C1'	-6.37	104.09	109.92
9	6	1002	ATP	C4'-O4'-C1'	-4.58	105.73	109.92
10	3	1002	ADP	N3-C2-N1	-4.18	123.00	128.67
10	3	1002	ADP	C4-C5-N7	-2.67	106.52	109.34

There are no chirality outliers.

5 of 18 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
9	2	1002	ATP	C5'-O5'-PA-O1A
9	2	1002	ATP	C5'-O5'-PA-O3A
9	4	1002	ATP	C5'-O5'-PA-O2A
9	6	1002	ATP	PB-O3B-PG-O2G
9	6	1002	ATP	C5'-O5'-PA-O2A

There are no ring outliers.

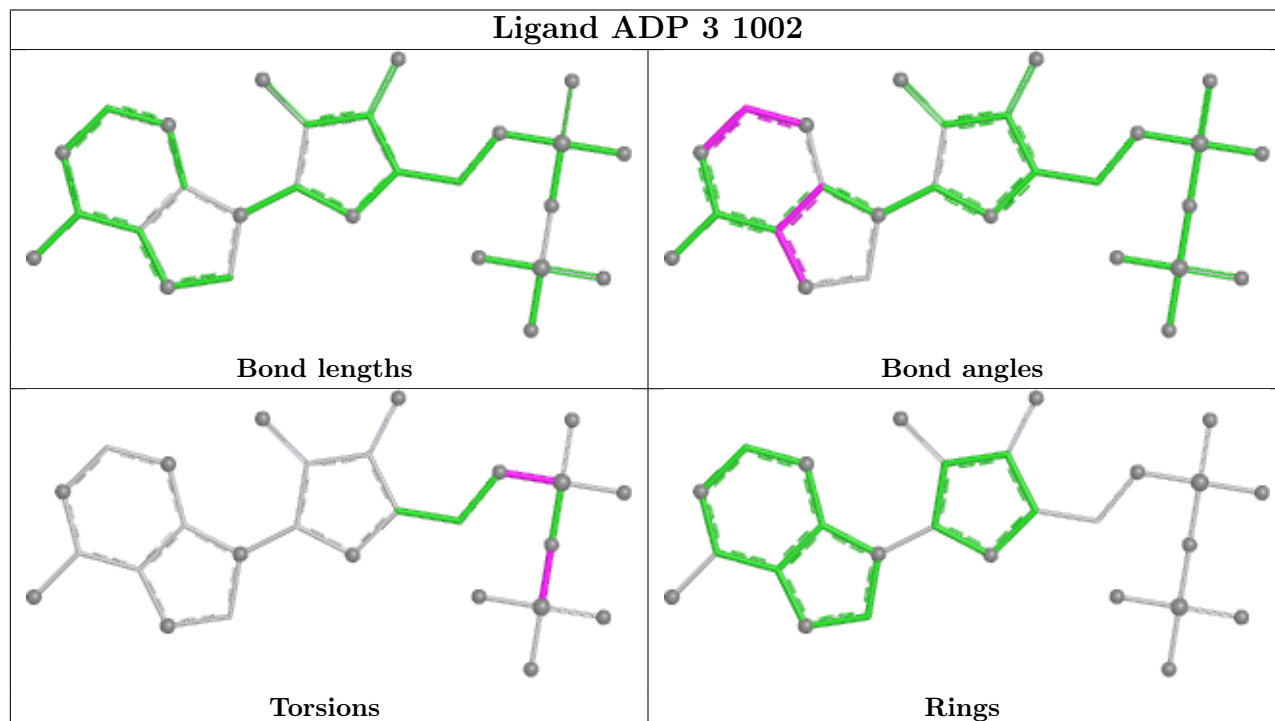
5 monomers are involved in 5 short contacts:

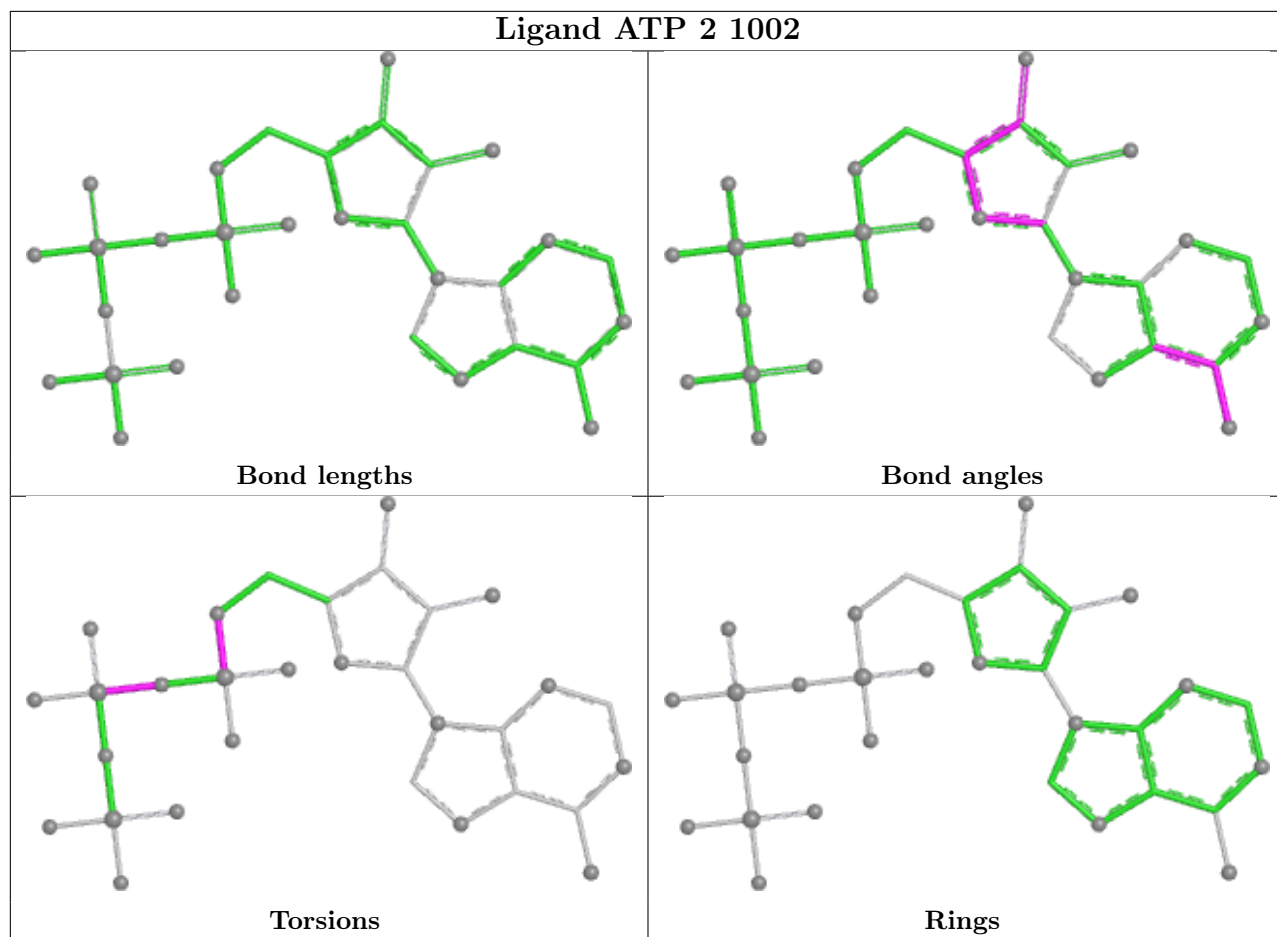
Mol	Chain	Res	Type	Clashes	Symm-Clashes
10	3	1002	ADP	1	0
9	2	1002	ATP	1	0
9	6	1002	ATP	1	0
9	7	1002	ATP	1	0
9	4	1002	ATP	1	0

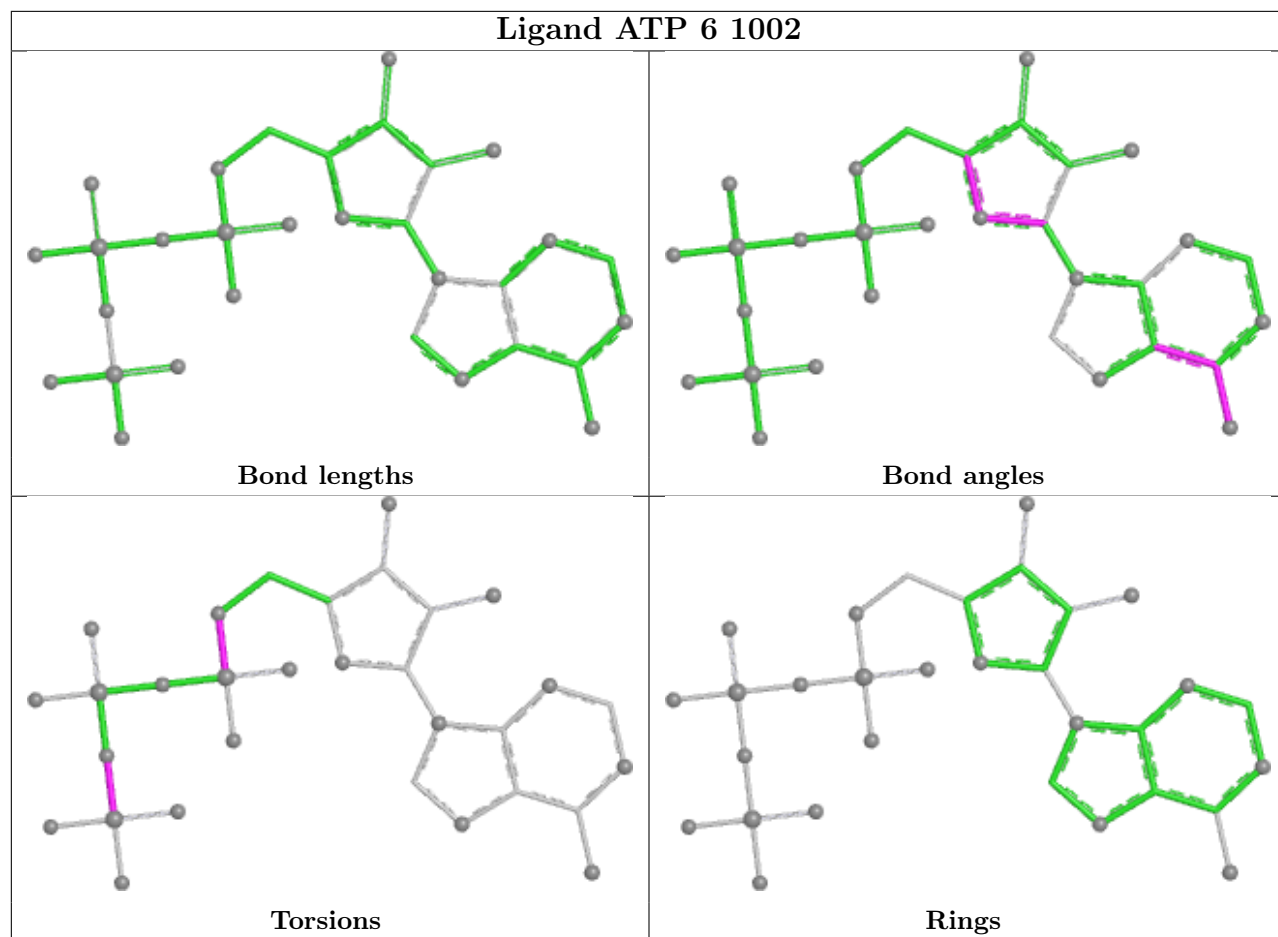
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is

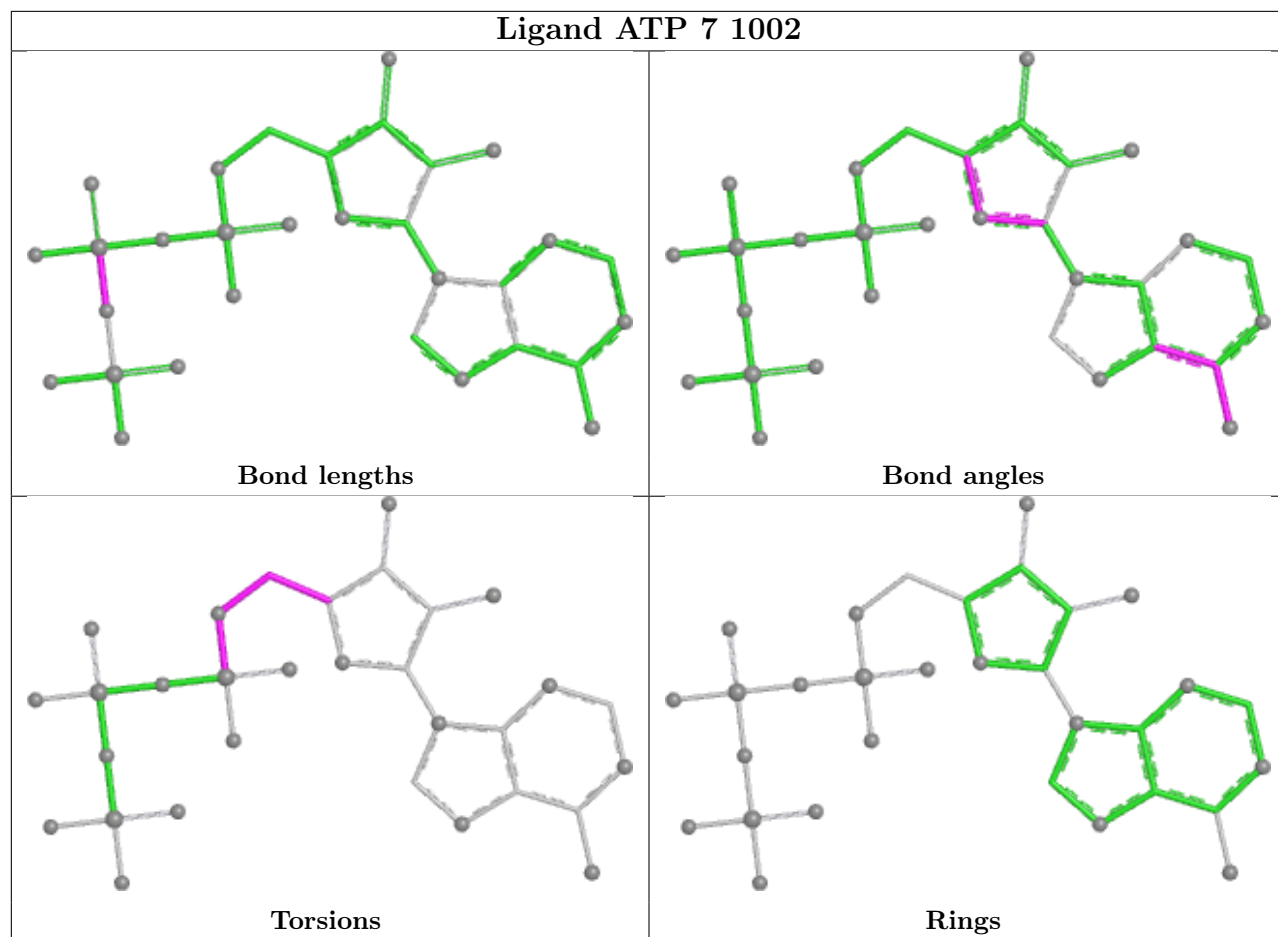


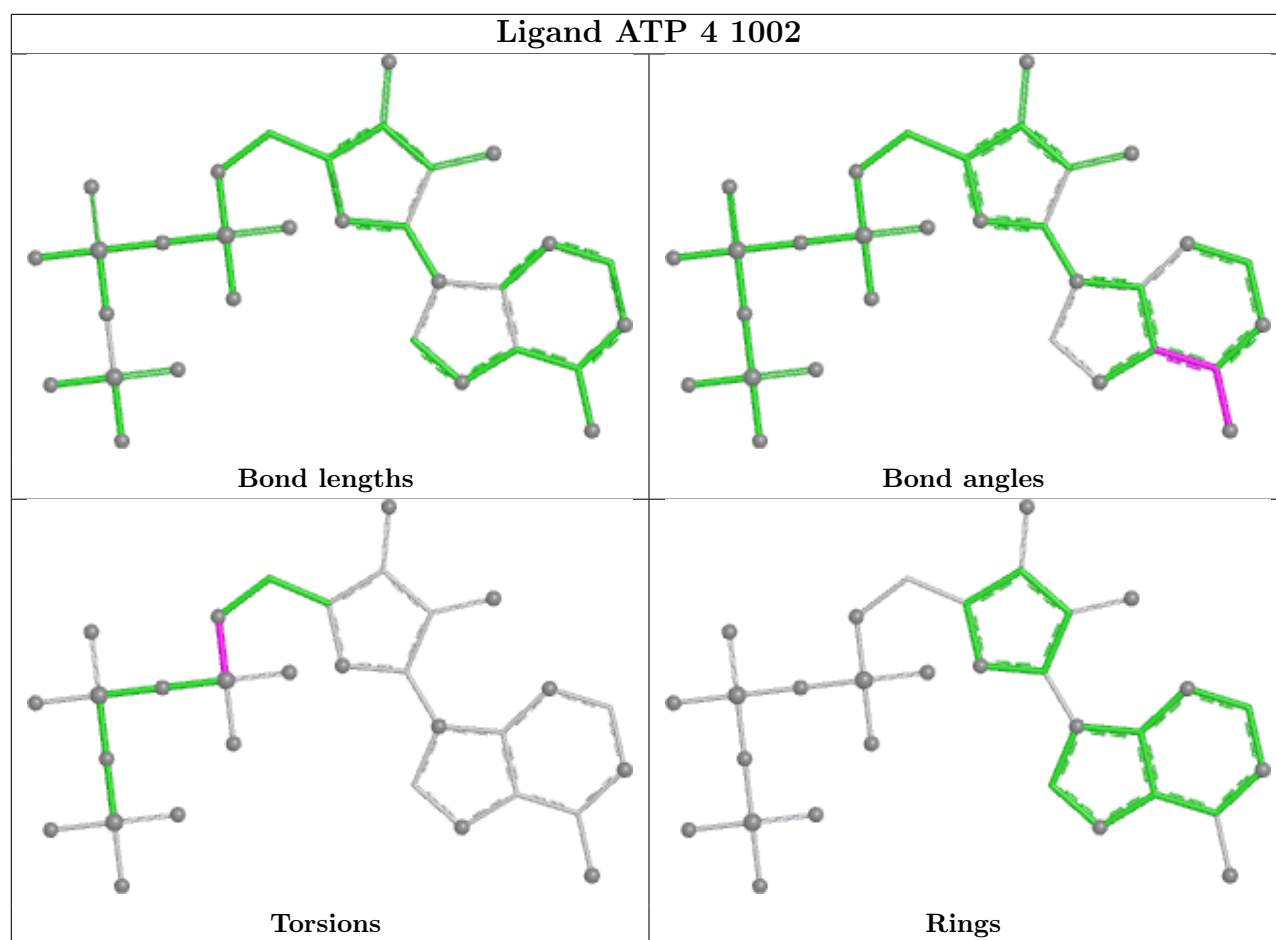
within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question 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.

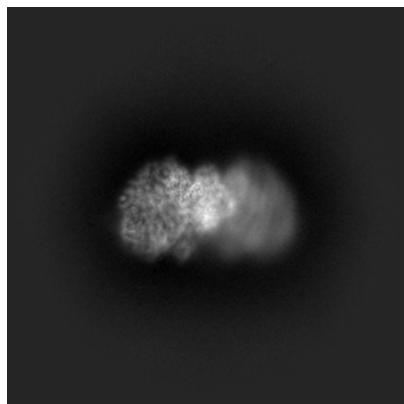
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-43710. These allow visual inspection of the internal detail of the map and identification of artifacts.

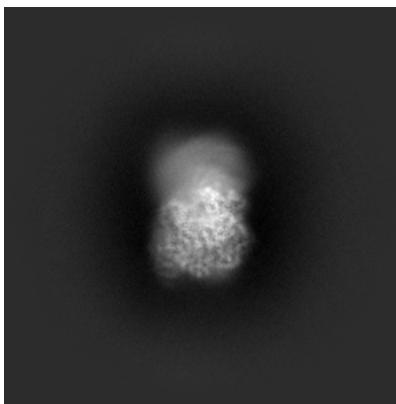
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

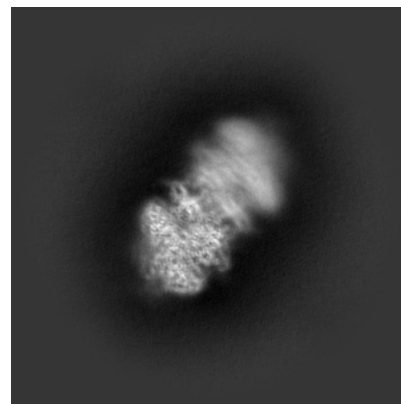
#### 6.1.1 Primary map



X

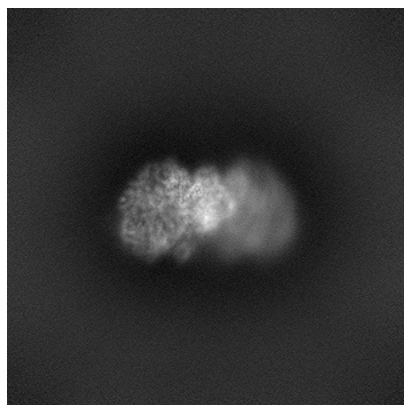


Y

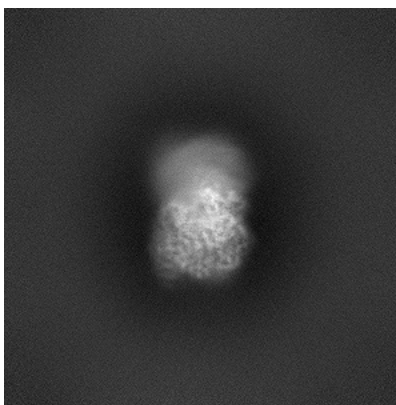


Z

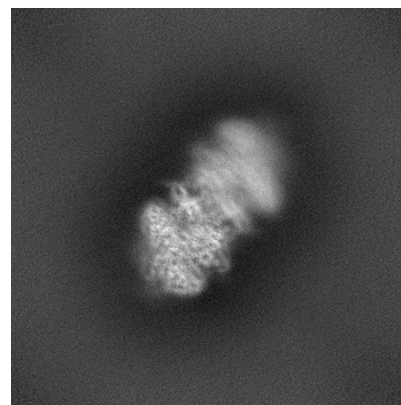
#### 6.1.2 Raw map



X



Y

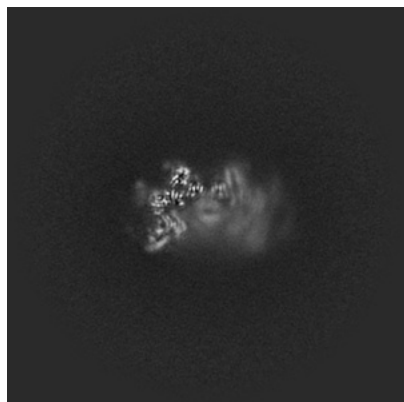


Z

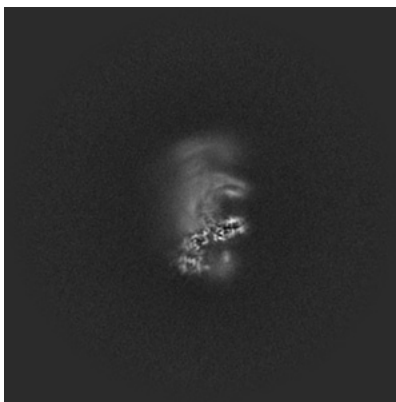
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

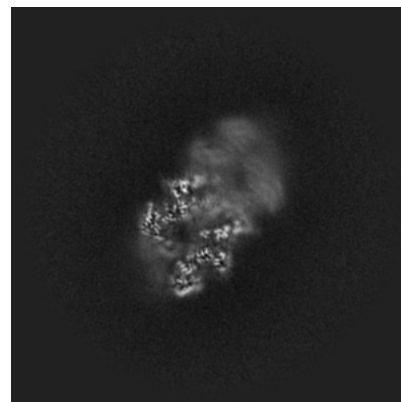
### 6.2.1 Primary map



X Index: 300



Y Index: 300



Z Index: 300

### 6.2.2 Raw map



X Index: 300



Y Index: 300

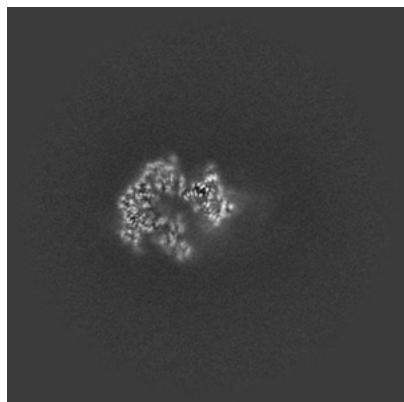


Z Index: 300

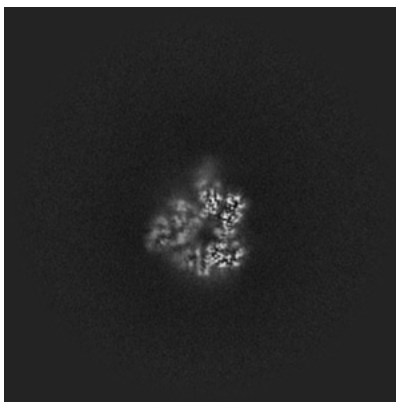
The images above show central slices of the map in three orthogonal directions.

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

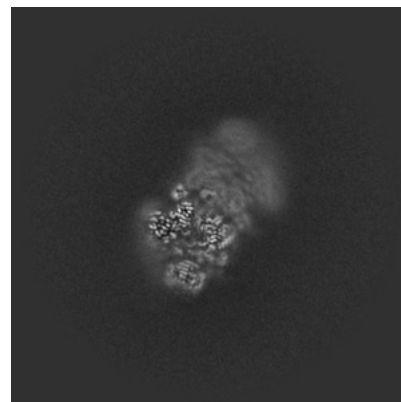
### 6.3.1 Primary map



X Index: 260

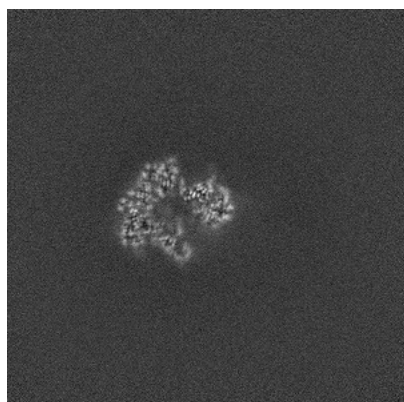


Y Index: 260

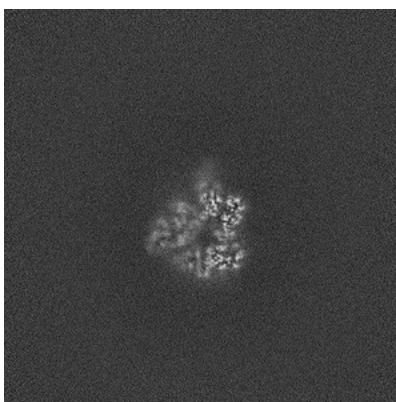


Z Index: 319

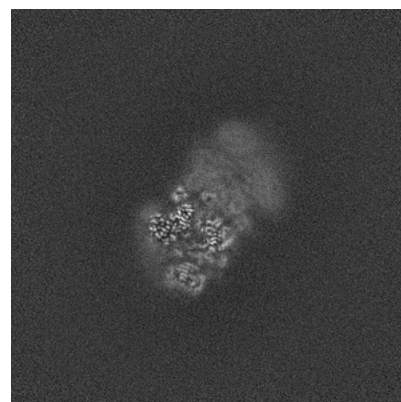
### 6.3.2 Raw map



X Index: 255



Y Index: 260



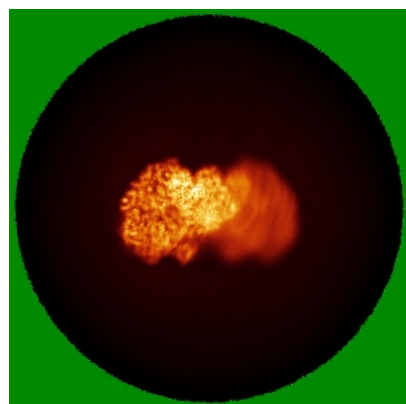
Z Index: 319

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

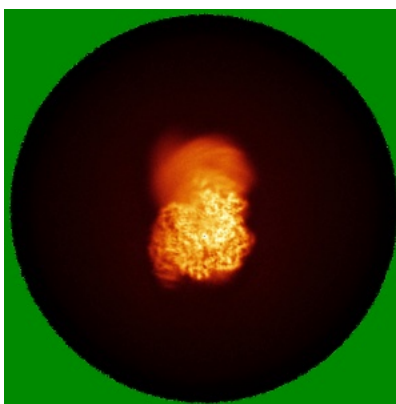


## 6.4 Orthogonal standard-deviation projections (False-color) [i](#)

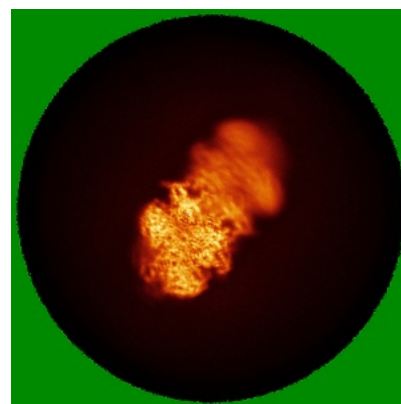
### 6.4.1 Primary map



X

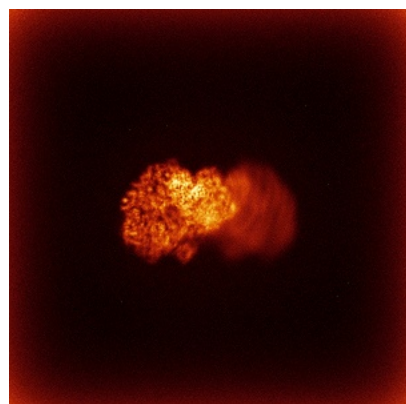


Y

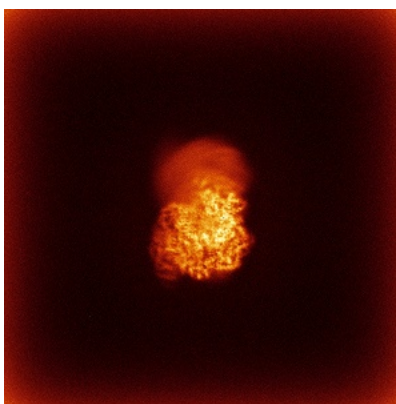


Z

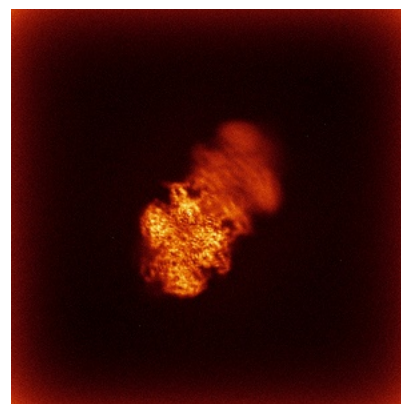
### 6.4.2 Raw map



X



Y

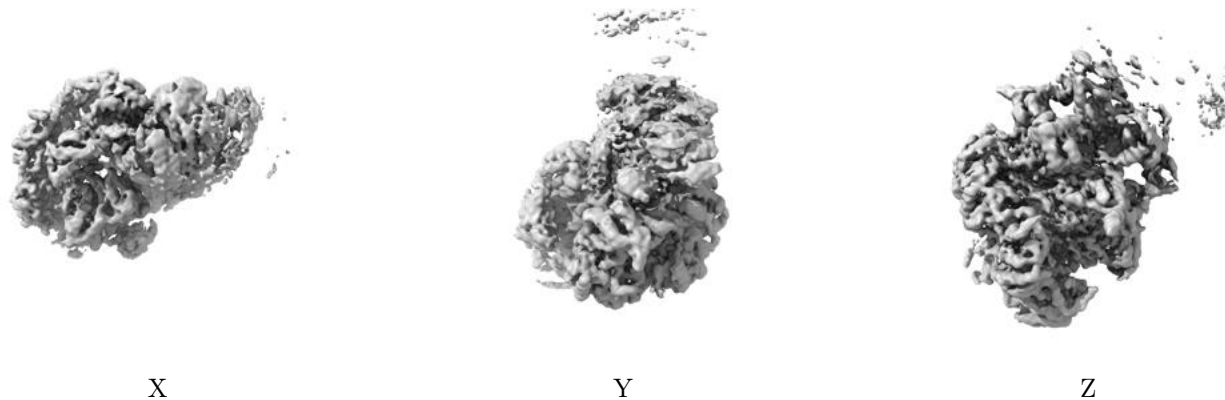


Z

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.

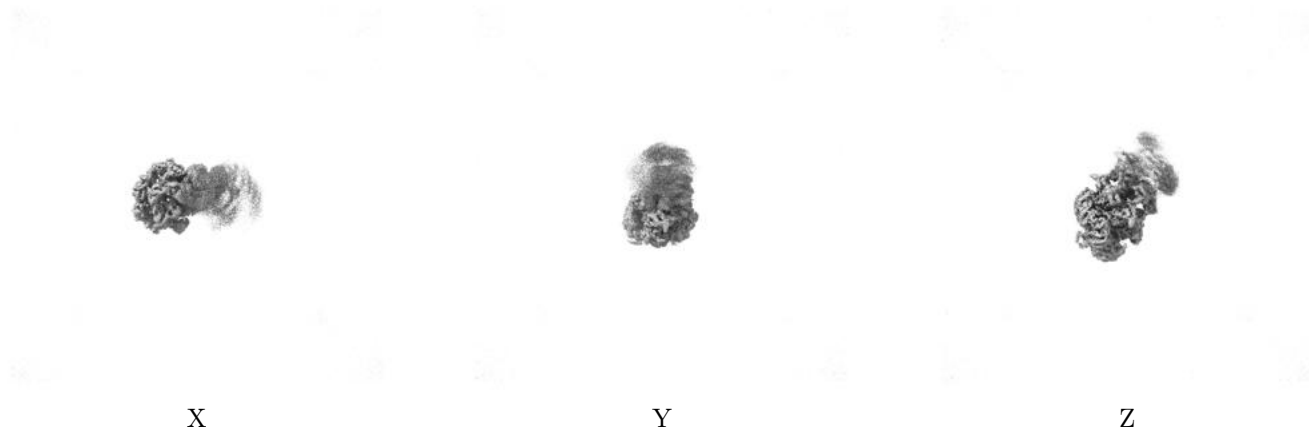
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.25. 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.

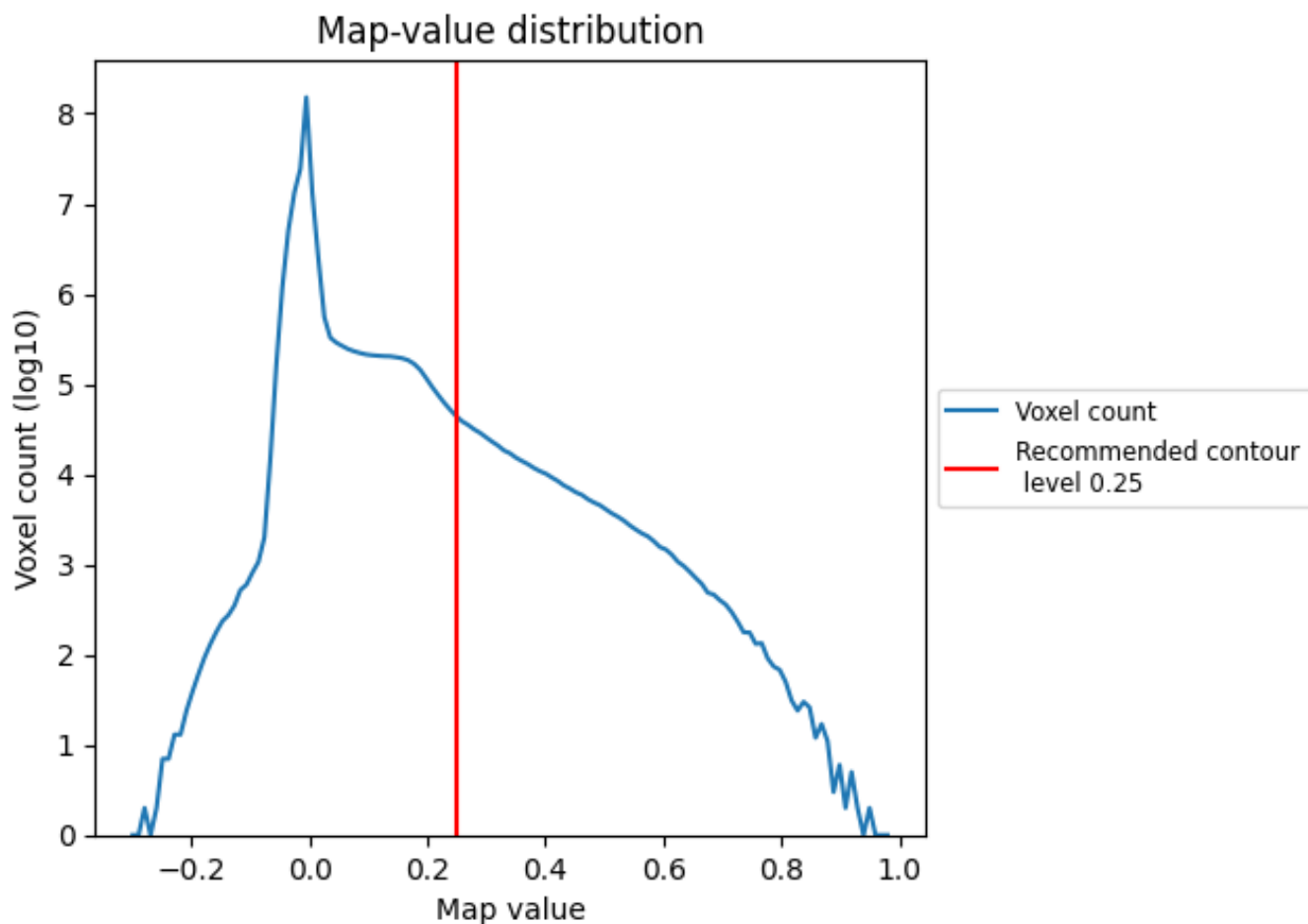
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

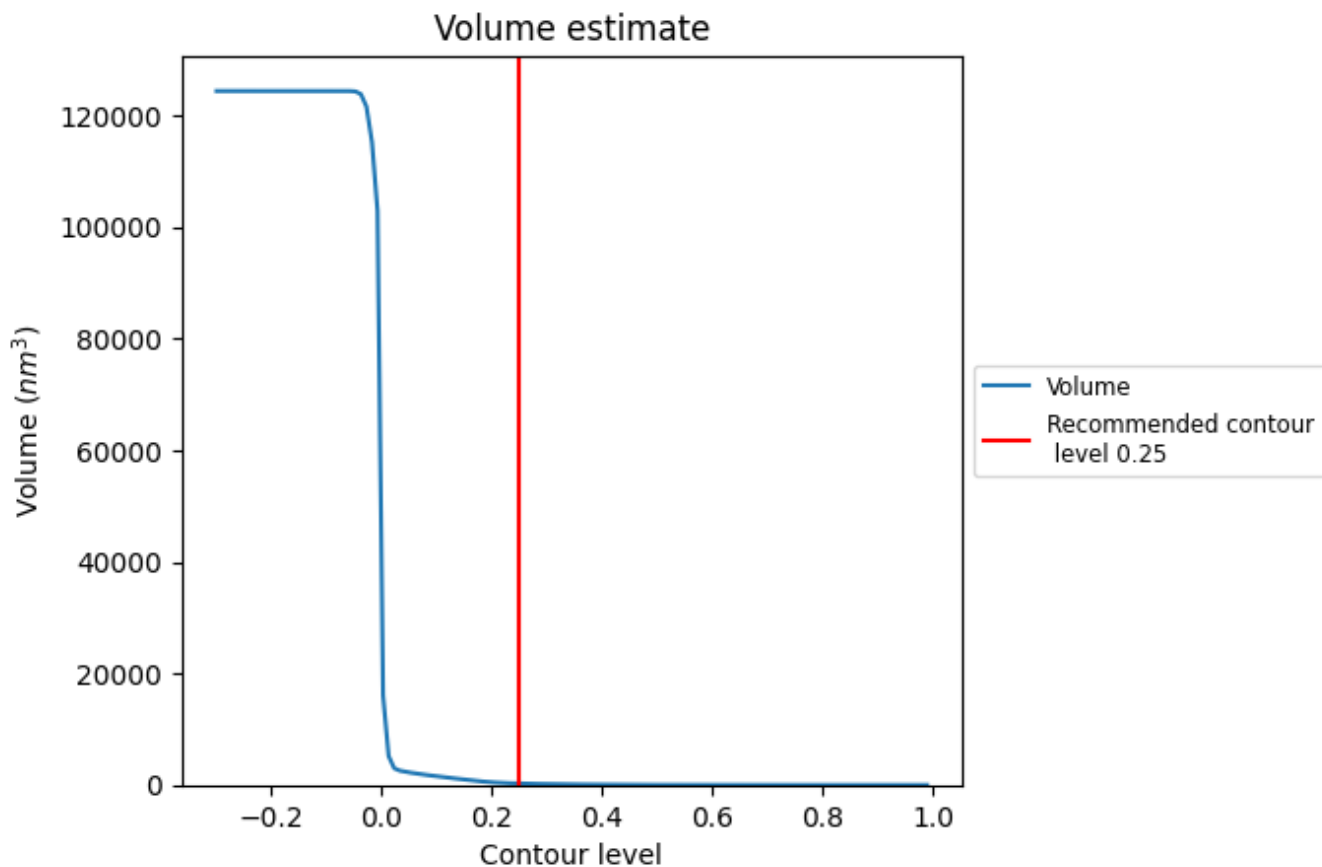
This section contains the results of statistical analysis of the map.

### 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.

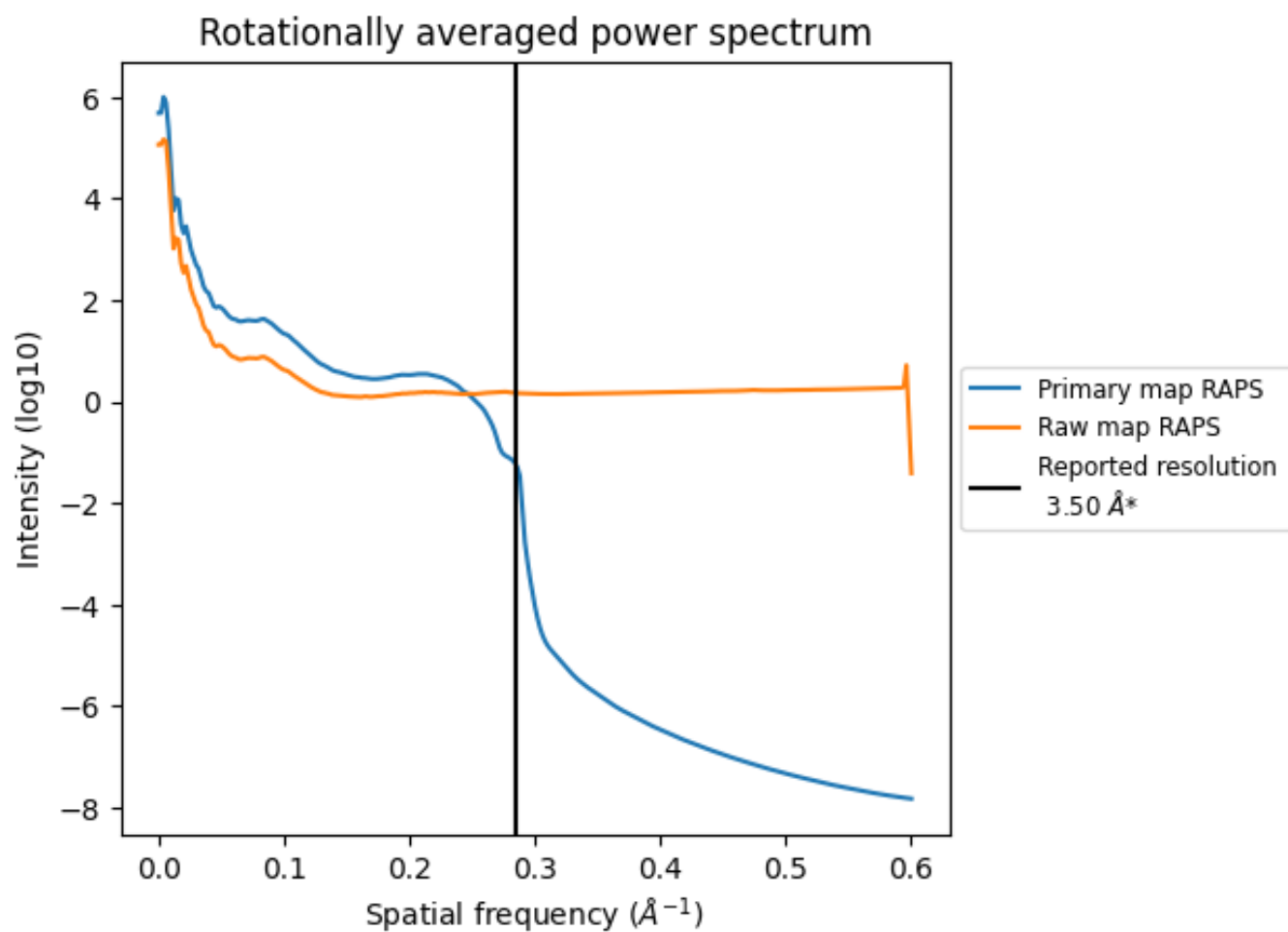
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 259  $\text{nm}^3$ ; this corresponds to an approximate mass of 234 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](#)

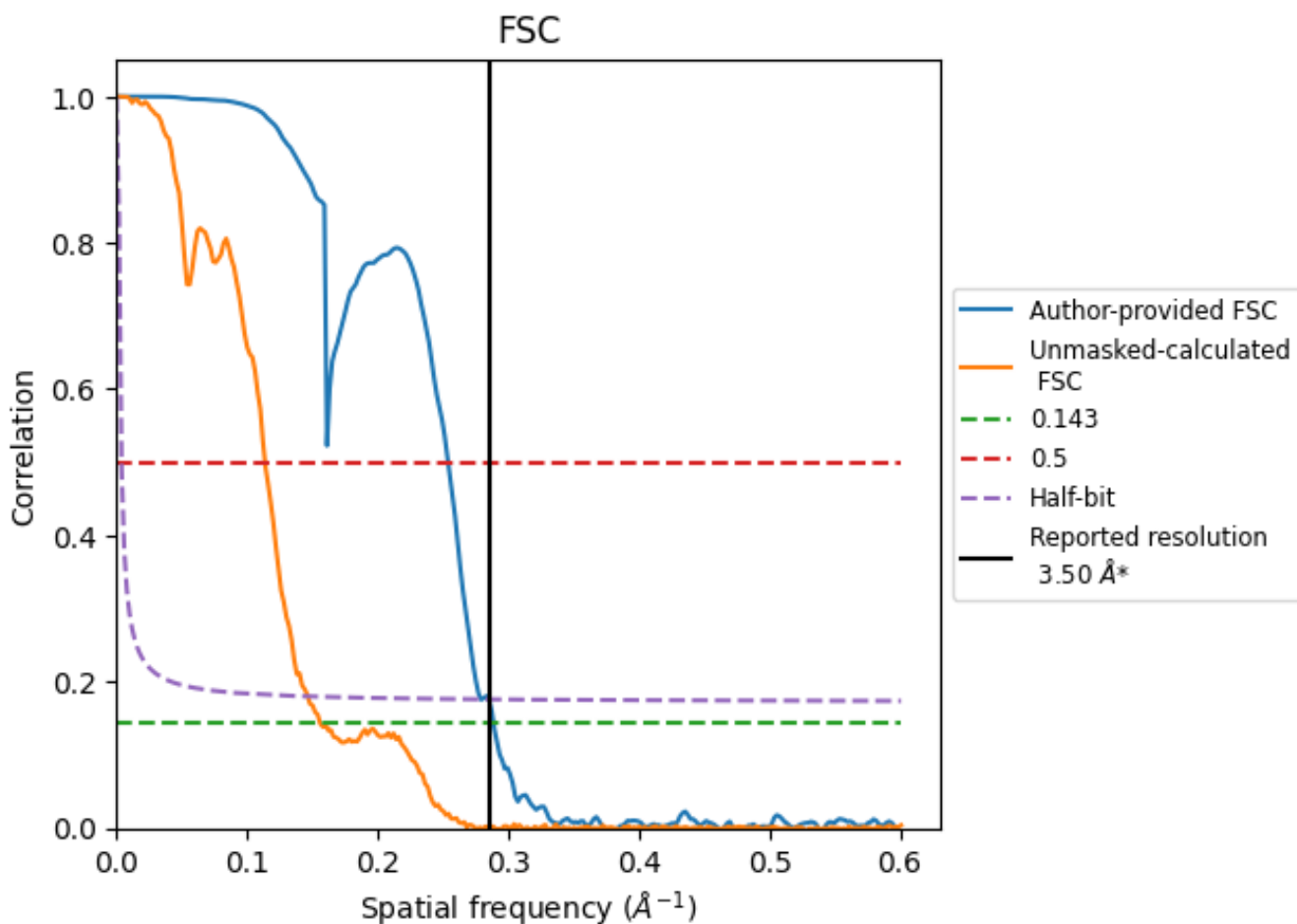


\*Reported resolution corresponds to spatial frequency of 0.286 Å<sup>-1</sup>

## 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 0.286 Å<sup>-1</sup>

## 8.2 Resolution estimates

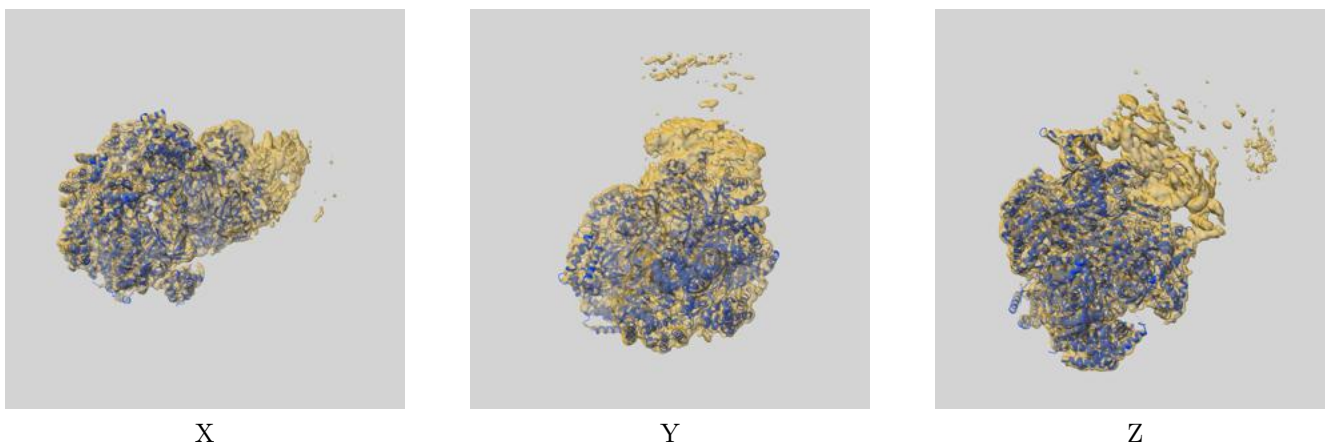
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.50	-	-
Author-provided FSC curve	3.46	3.94	3.58
Unmasked-calculated*	6.41	8.79	6.82

\*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 6.41 differs from the reported value 3.5 by more than 10 %

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

This section contains information regarding the fit between EMDB map EMD-43710 and PDB model 8W0I. Per-residue inclusion information can be found in section 3 on page 7.

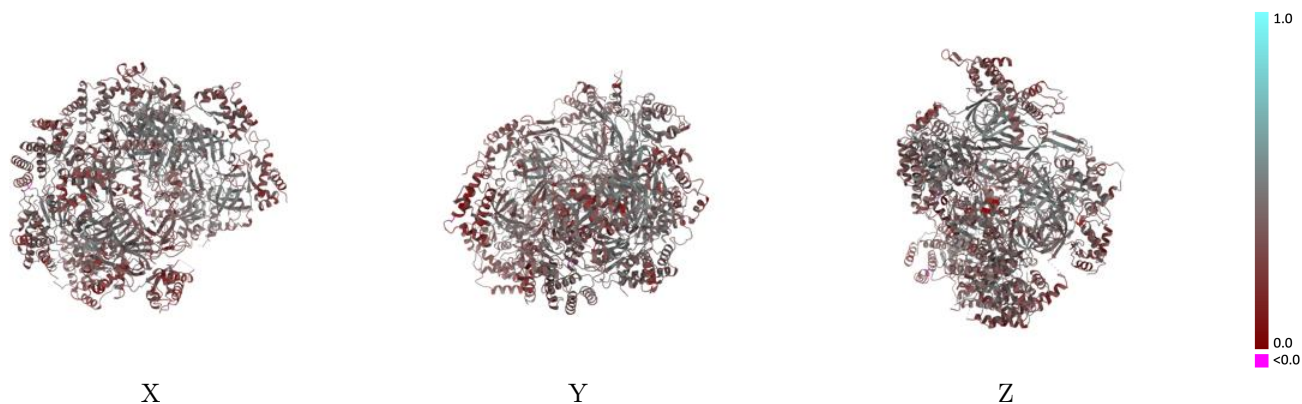
### 9.1 Map-model overlay [i](#)



The images above show the 3D surface view of the map at the recommended contour level 0.25 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.

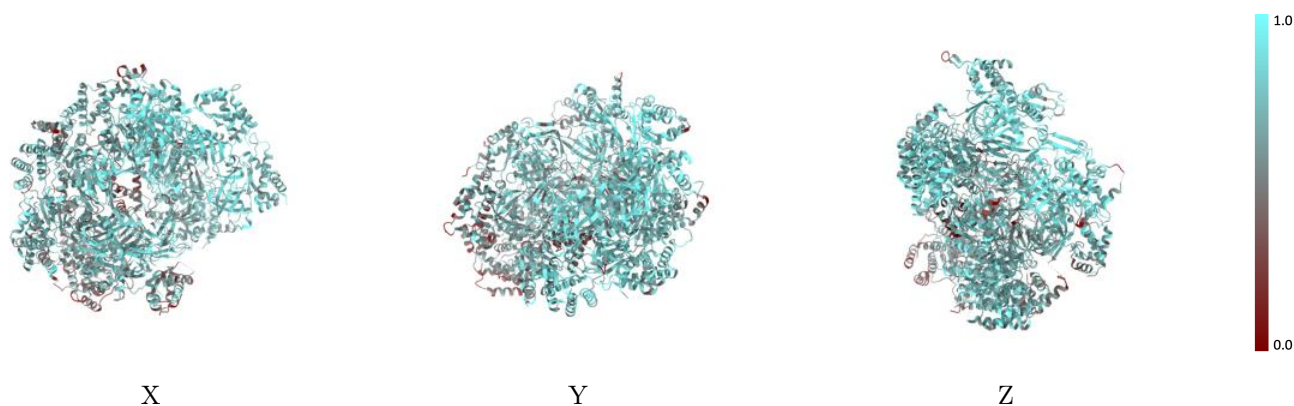


## 9.2 Q-score mapped to coordinate model [i](#)



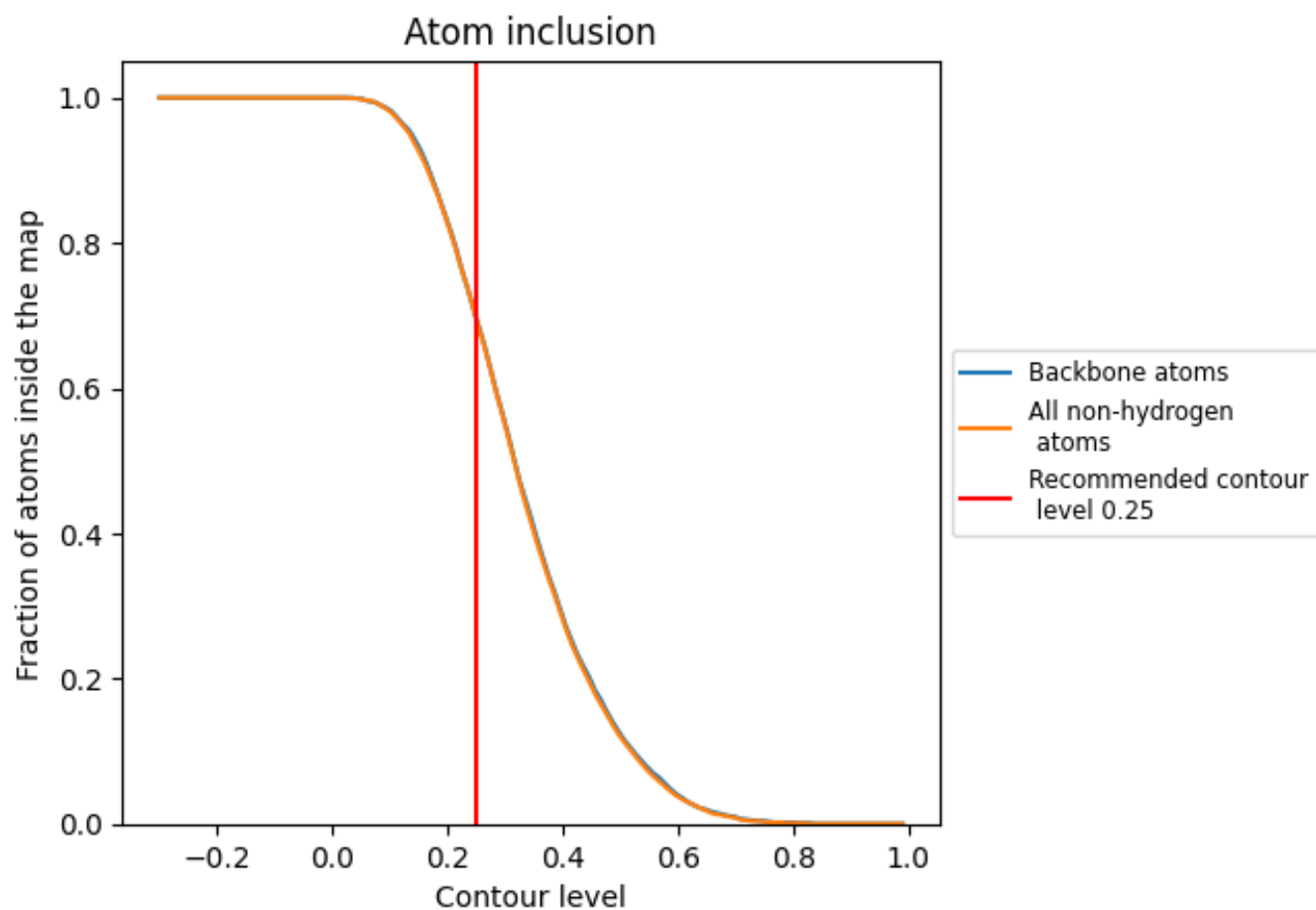
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.25).















## 9.4 Atom inclusion [i](#)



At the recommended contour level, 70% of all backbone atoms, 70% 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 (0.25) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6950	 0.3670
2	 0.5380	 0.3040
3	 0.8130	 0.4120
4	 0.7000	 0.3640
5	 0.7220	 0.3510
6	 0.7040	 0.3690
7	 0.7730	 0.4010

