



## Full wwPDB EM Validation Report ⓘ

Nov 20, 2022 – 03:25 PM EST

PDB ID : 3JC5  
EMDB ID : EMD-6535  
Title : Structure of the eukaryotic replicative CMG helicase and pumpjack motion  
Authors : Li, H.; Bai, L.; Yuan, Z.; Sun, J.; Georgescu, R.E.; Liu, J.; O'Donnell, M.E.  
Deposited on : 2015-11-24  
Resolution : 4.70 Å (reported)  
Based on initial model : 2Q9Q

This is a Full wwPDB EM Validation 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:

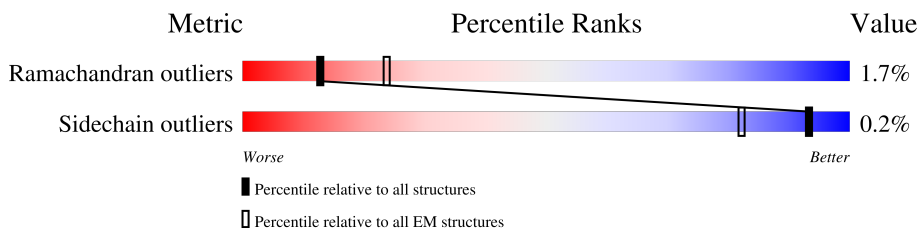
EMDB validation analysis : 0.0.1.dev43  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : 1.9.9  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.3

# 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 4.70 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.



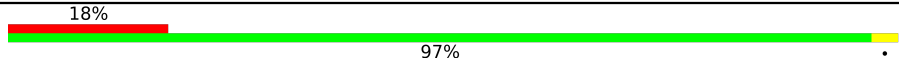

Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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	868	25% (red), 66% (green), 33% (grey)
2	3	971	18% (red), 58% (green), 39% (grey)
3	4	933	31% (red), 59% (green), 39% (grey)
4	5	775	25% (red), 80% (green), 16% (grey)
5	6	1017	29% (red), 64% (green), 34% (grey)
6	7	845	30% (red), 76% (green), 23% (grey)
7	c	650	11% (red), 84% (green), 15% (grey)
8	D	294	73% (green), 25% (grey)
9	B	213	85% (green), 15% (grey)

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Mol	Chain	Length	Quality of chain
10	A	208	 <p>18% 97% 5%</p>
11	C	194	 <p>5% 81% 18%</p>

## 2 Entry composition [i](#)

There are 11 unique types of molecules in this entry. The entry contains 40041 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 replication licensing factor MCM2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	2	584	4600	2904	819	861	16	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	3	588	4613	2909	820	871	13	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	4	569	4516	2842	783	864	27	0	0

- Molecule 4 is a protein called Minichromosome maintenance protein 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	5	653	5171	3251	896	1001	23	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	6	671	5211	3291	916	981	23	0	0

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

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
6	7	652	5148	3249	895	977	27	0	0

- Molecule 7 is a protein called Cell division control protein 45.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
7	c	553	4470	2852	759	846	13	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
c	22	ALA	HIS	CONFLICT	UNP Q08032
c	155	GLU	GLN	CONFLICT	UNP Q08032
c	551	THR	TRP	CONFLICT	UNP Q08032

- Molecule 8 is a protein called DNA replication complex GINS protein SLD5.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
8	D	221	1820	1159	300	348	13	0	0

- Molecule 9 is a protein called DNA replication complex GINS protein PSF2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
9	B	181	1513	978	261	270	4	0	0

- Molecule 10 is a protein called DNA replication complex GINS protein PSF1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
10	A	208	1691	1062	287	332	10	0	0

There are 3 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	161	ALA	VAL	CONFLICT	UNP Q12488
A	192	GLN	ARG	CONFLICT	UNP Q12488
A	207	LEU	LYS	CONFLICT	UNP Q12488

- Molecule 11 is a protein called DNA replication complex GINS protein PSF3.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
11	C	159	1288	843	207	232	6	0	0





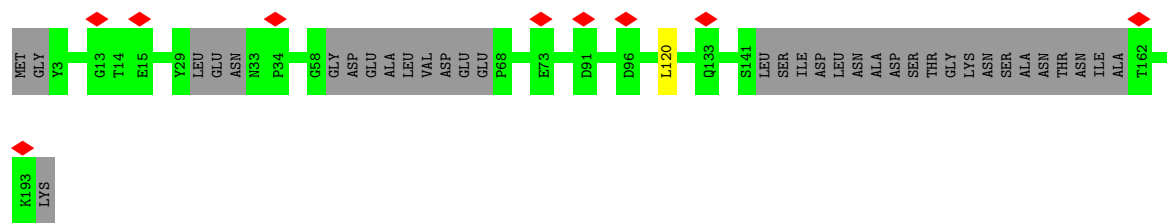
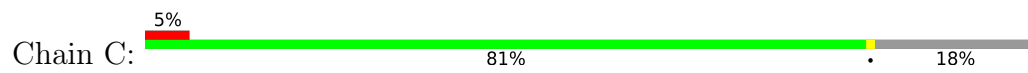












## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	178530	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	CTFFIND4	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	3500	Depositor
Magnification	49505	Depositor
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.064	Depositor
Minimum map value	-0.029	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.018	Depositor
Map size ( $\text{\AA}$ )	258.56, 258.56, 258.56	wwPDB
Map dimensions	256, 256, 256	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	1.01, 1.01, 1.01	Depositor

## 5 Model quality [i](#)

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

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	0.41	0/4677	0.62	2/6318 (0.0%)
2	3	0.48	1/4691 (0.0%)	0.66	5/6360 (0.1%)
3	4	0.40	0/4574	0.65	1/6172 (0.0%)
4	5	0.48	1/5242 (0.0%)	0.73	7/7075 (0.1%)
5	6	0.48	1/5289 (0.0%)	0.78	13/7139 (0.2%)
6	7	0.42	0/5228	0.64	1/7062 (0.0%)
7	c	0.39	0/4548	0.63	2/6152 (0.0%)
8	D	0.43	0/1853	0.64	0/2500
9	B	0.43	0/1545	0.69	0/2092
10	A	0.38	0/1713	0.62	0/2309
11	C	0.46	0/1320	0.64	1/1784 (0.1%)
All	All	0.44	3/40680 (0.0%)	0.67	32/54963 (0.1%)

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	2	0	1
2	3	0	3
3	4	0	5
5	6	0	6
6	7	0	7
7	c	0	1
8	D	0	2
10	A	0	4
All	All	0	29

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	3	232	PRO	N-CD	16.13	1.70	1.47

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	6	929	GLU	C-O	7.76	1.38	1.23
4	5	720	ARG	C-N	-7.10	1.17	1.34

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	6	954	TYR	CB-CG-CD2	-16.55	111.07	121.00
4	5	742	ARG	CA-CB-CG	10.90	137.38	113.40
5	6	954	TYR	CB-CG-CD1	9.43	126.66	121.00
2	3	550	THR	N-CA-C	-9.05	86.57	111.00
4	5	742	ARG	N-CA-C	8.60	134.21	111.00
7	c	27	LEU	CA-CB-CG	7.96	133.61	115.30
4	5	258	LEU	CA-CB-CG	7.60	132.78	115.30
5	6	960	LEU	CB-CG-CD2	-7.30	98.58	111.00
2	3	171	LEU	CA-CB-CG	7.22	131.91	115.30
5	6	948	LEU	CB-CG-CD1	-7.22	98.73	111.00
4	5	758	HIS	O-C-N	6.87	133.69	122.70
5	6	105	ASP	CB-CG-OD1	6.58	124.22	118.30
5	6	958	ARG	NE-CZ-NH1	6.25	123.43	120.30
5	6	915	MET	CG-SD-CE	6.14	110.03	100.20
1	2	436	GLY	N-CA-C	5.96	128.01	113.10
2	3	550	THR	CB-CA-C	5.88	127.48	111.60
5	6	930	GLU	CG-CD-OE1	-5.84	106.62	118.30
11	C	120	LEU	CA-CB-CG	5.77	128.58	115.30
4	5	755	LEU	N-CA-CB	-5.65	99.09	110.40
6	7	127	LEU	CA-CB-CG	5.51	127.97	115.30
7	c	637	LEU	CA-CB-CG	5.48	127.89	115.30
5	6	923	VAL	CA-C-O	-5.42	108.72	120.10
1	2	570	GLY	N-CA-C	5.33	126.42	113.10
3	4	727	LEU	CA-CB-CG	5.28	127.44	115.30
4	5	743	PHE	CB-CG-CD2	5.21	124.45	120.80
5	6	910	VAL	CG1-CB-CG2	-5.20	102.59	110.90
5	6	744	PRO	C-N-CD	5.11	139.14	128.40
4	5	179	LEU	CA-CB-CG	5.10	127.02	115.30
2	3	653	ILE	C-N-CD	5.07	139.05	128.40
2	3	517	ASN	C-N-CD	5.07	139.05	128.40
5	6	743	GLU	C-N-CD	5.06	139.03	128.40
5	6	960	LEU	N-CA-CB	-5.00	100.39	110.40

There are no chirality outliers.

All (29) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	2	803	PHE	Peptide
2	3	163	ALA	Peptide
2	3	165	ALA	Peptide
2	3	428	LEU	Peptide
3	4	202	LYS	Peptide
3	4	245	ALA	Peptide
3	4	372	GLU	Peptide
3	4	377	ASN	Peptide
3	4	448	SER	Peptide
5	6	103	VAL	Peptide
5	6	313	MET	Peptide
5	6	334	PRO	Peptide
5	6	600	GLY	Peptide
5	6	923	VAL	Mainchain
5	6	929	GLU	Peptide
6	7	221	SER	Peptide
6	7	257	VAL	Peptide
6	7	283	GLU	Peptide
6	7	359	PRO	Peptide
6	7	545	THR	Peptide
6	7	678	LYS	Peptide
6	7	680	SER	Peptide
10	A	104	ASN	Peptide
10	A	105	ASN	Peptide
10	A	106	GLY	Peptide
10	A	160	ASP	Peptide
8	D	200	LYS	Peptide
8	D	258	VAL	Peptide
7	c	97	GLU	Peptide

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

Due to software issues we are unable to calculate clashes - this section is therefore empty.

## 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	574/868 (66%)	521 (91%)	44 (8%)	9 (2%)	9	45
2	3	578/971 (60%)	503 (87%)	57 (10%)	18 (3%)	4	30
3	4	547/933 (59%)	475 (87%)	61 (11%)	11 (2%)	7	40
4	5	637/775 (82%)	555 (87%)	61 (10%)	21 (3%)	4	29
5	6	661/1017 (65%)	591 (89%)	58 (9%)	12 (2%)	8	41
6	7	642/845 (76%)	561 (87%)	73 (11%)	8 (1%)	13	50
7	c	543/650 (84%)	496 (91%)	45 (8%)	2 (0%)	34	72
8	D	215/294 (73%)	197 (92%)	16 (7%)	2 (1%)	17	56
9	B	177/213 (83%)	163 (92%)	14 (8%)	0	100	100
10	A	206/208 (99%)	179 (87%)	26 (13%)	1 (0%)	29	68
11	C	151/194 (78%)	144 (95%)	7 (5%)	0	100	100
All	All	4931/6968 (71%)	4385 (89%)	462 (9%)	84 (2%)	13	43

All (84) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	2	291	SER
2	3	499	LYS
2	3	517	ASN
2	3	569	HIS
3	4	450	GLN
4	5	339	THR
4	5	348	MET
4	5	449	LEU
4	5	580	ALA
4	5	596	ILE
5	6	745	PRO
5	6	930	GLU
6	7	26	VAL
6	7	464	VAL
6	7	544	GLN
7	c	601	ILE
2	3	389	VAL
2	3	460	GLY
2	3	521	GLY
2	3	523	TYR

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	4	419	VAL
3	4	494	GLU
3	4	711	LYS
3	4	712	VAL
3	4	714	GLU
3	4	716	ASN
3	4	717	ASP
4	5	342	ILE
4	5	410	ILE
4	5	466	GLY
4	5	579	ASN
5	6	402	ILE
5	6	541	GLU
5	6	560	VAL
5	6	819	ILE
5	6	929	GLU
6	7	488	SER
1	2	435	ASP
1	2	439	ASN
2	3	230	ILE
2	3	520	PHE
4	5	352	GLU
4	5	444	SER
4	5	468	ALA
4	5	582	ALA
4	5	729	SER
4	5	759	GLU
5	6	106	VAL
5	6	744	PRO
1	2	298	SER
1	2	533	ILE
1	2	585	ILE
2	3	158	LYS
2	3	172	THR
2	3	441	GLY
3	4	493	ASN
4	5	153	SER
4	5	154	GLU
4	5	267	VAL
4	5	450	THR
5	6	321	VAL
6	7	257	VAL

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Mol	Chain	Res	Type
8	D	219	ILE
8	D	255	CYS
10	A	27	VAL
2	3	437	SER
2	3	440	VAL
2	3	450	ARG
5	6	410	LEU
5	6	569	ILE
6	7	678	LYS
1	2	297	ILE
2	3	556	ILE
7	c	98	ILE
1	2	687	VAL
2	3	439	GLY
4	5	725	GLY
6	7	258	ILE
1	2	303	ILE
3	4	433	ILE
3	4	463	VAL
4	5	443	GLY
6	7	248	VAL
2	3	326	VAL

### 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	503/770 (65%)	503 (100%)	0	100	100
2	3	511/835 (61%)	511 (100%)	0	100	100
3	4	509/848 (60%)	509 (100%)	0	100	100
4	5	588/688 (86%)	586 (100%)	2 (0%)	92	95
5	6	547/886 (62%)	547 (100%)	0	100	100
6	7	576/753 (76%)	576 (100%)	0	100	100
7	c	498/585 (85%)	495 (99%)	3 (1%)	86	92

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
8	D	213/279 (76%)	212 (100%)	1 (0%)	88	93
9	B	171/198 (86%)	170 (99%)	1 (1%)	86	92
10	A	192/192 (100%)	191 (100%)	1 (0%)	88	93
11	C	144/173 (83%)	144 (100%)	0	100	100
All	All	4452/6207 (72%)	4444 (100%)	8 (0%)	93	96

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
4	5	471	LEU
4	5	614	LEU
7	c	27	LEU
7	c	34	LEU
7	c	152	LEU
8	D	168	LEU
9	B	175	LEU
10	A	151	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (63) such sidechains are listed below:

Mol	Chain	Res	Type
1	2	238	ASN
1	2	386	GLN
1	2	439	ASN
1	2	613	ASN
1	2	658	ASN
1	2	809	HIS
1	2	849	GLN
1	2	856	GLN
2	3	29	GLN
2	3	349	ASN
2	3	351	ASN
2	3	395	ASN
2	3	404	ASN
2	3	493	GLN
2	3	661	GLN
2	3	670	GLN
3	4	184	ASN
3	4	231	ASN
3	4	247	ASN

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<b>Mol</b>	<b>Chain</b>	<b>Res</b>	<b>Type</b>
3	4	579	GLN
3	4	646	HIS
3	4	676	ASN
3	4	757	HIS
4	5	49	GLN
4	5	53	ASN
4	5	58	ASN
4	5	196	ASN
4	5	253	GLN
4	5	259	GLN
4	5	411	ASN
4	5	494	HIS
4	5	500	GLN
4	5	576	HIS
4	5	585	ASN
4	5	716	GLN
5	6	653	HIS
5	6	690	ASN
5	6	698	ASN
6	7	76	ASN
6	7	87	GLN
6	7	89	GLN
6	7	311	GLN
6	7	316	GLN
6	7	455	ASN
6	7	538	HIS
6	7	544	GLN
6	7	585	ASN
6	7	620	HIS
6	7	622	HIS
7	c	243	GLN
7	c	249	ASN
7	c	266	ASN
7	c	550	ASN
7	c	604	ASN
8	D	110	ASN
9	B	62	ASN
9	B	146	GLN
9	B	179	ASN
10	A	104	ASN
10	A	175	GLN
10	A	202	GLN

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Mol	Chain	Res	Type
11	C	41	ASN
11	C	138	HIS

### 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 monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 5.7 Other polymers [i](#)

There are no such residues in this entry.

### 5.8 Polymer linkage issues [i](#)

The following chains have linkage breaks:

Mol	Chain	Number of breaks
6	7	1
3	4	1
4	5	1

All chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	7	386:LYS	C	387:LYS	N	7.90
1	4	467:LYS	C	468:LYS	N	3.57
1	5	720:ARG	C	721:ARG	N	1.17

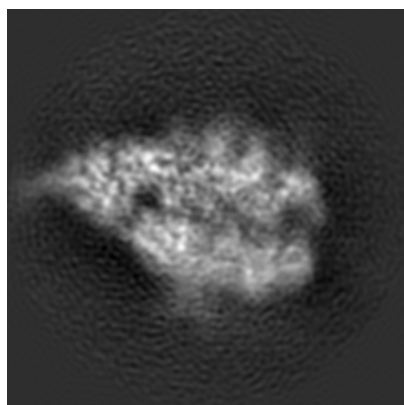
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-6535. These allow visual inspection of the internal detail of the map and identification of artifacts.

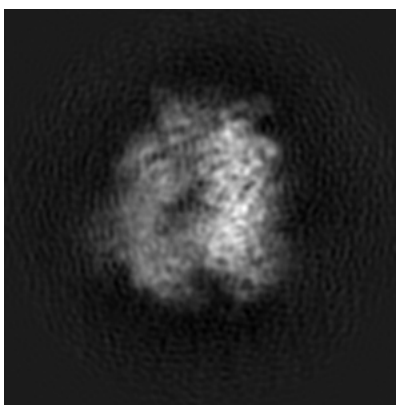
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

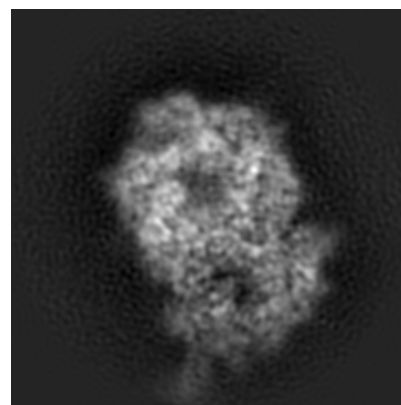
#### 6.1.1 Primary map



X



Y

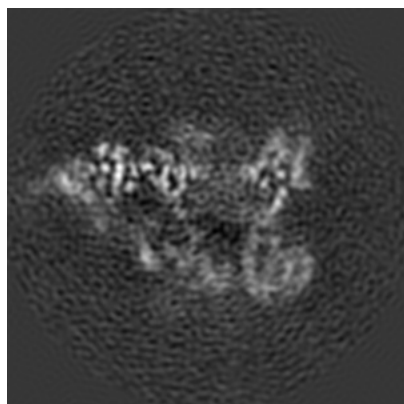


Z

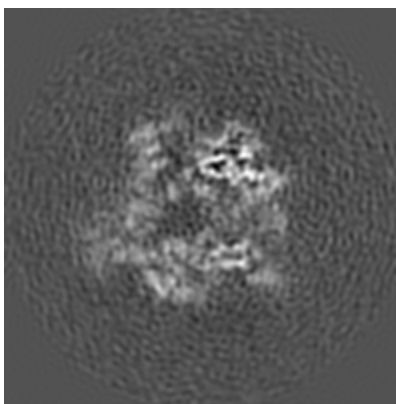
The images above show the map projected in three orthogonal directions.

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

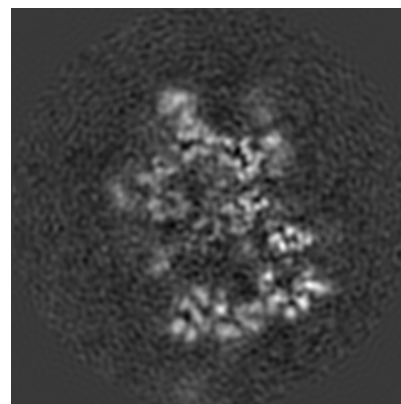
#### 6.2.1 Primary map



X Index: 128



Y Index: 128

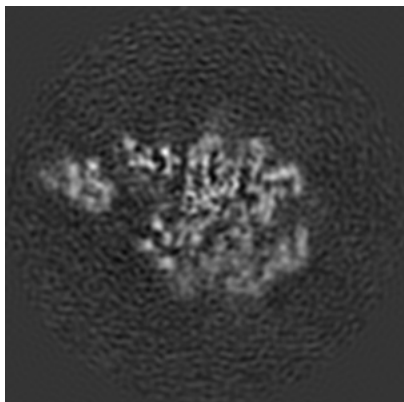


Z Index: 128

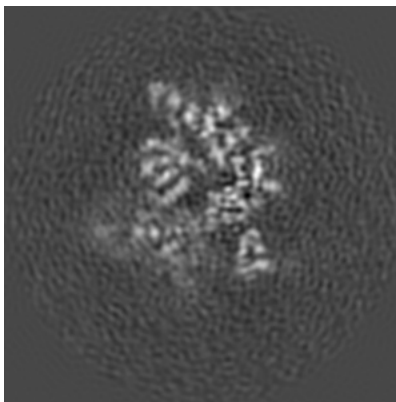
The images above show central slices of the map in three orthogonal directions.

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

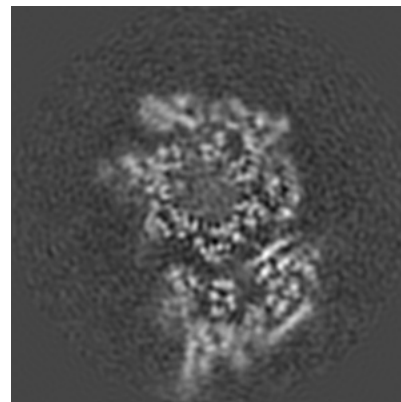
### 6.3.1 Primary map



X Index: 150



Y Index: 102

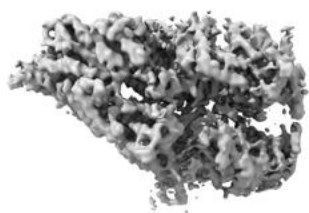


Z Index: 145

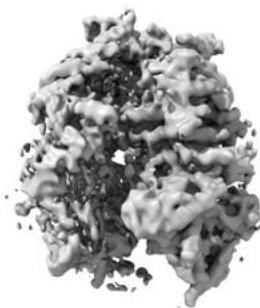
The images above show the largest variance slices of the map in three orthogonal directions.

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

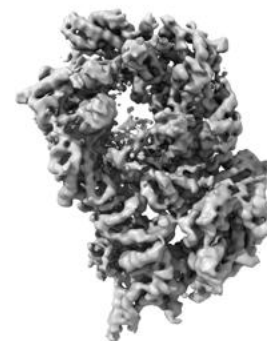
### 6.4.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.018. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.



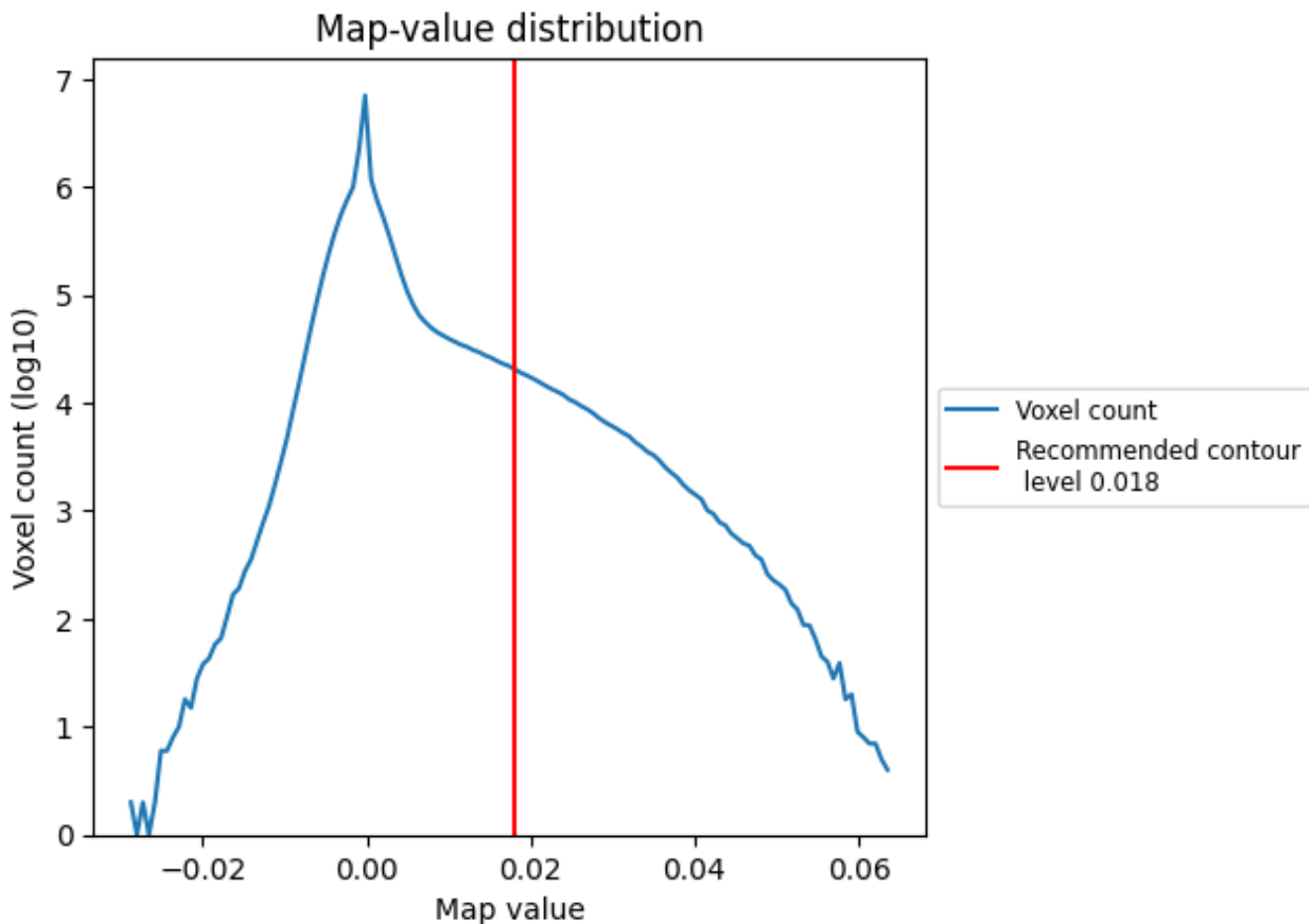
## 6.5 Mask visualisation

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

## 7 Map analysis [i](#)

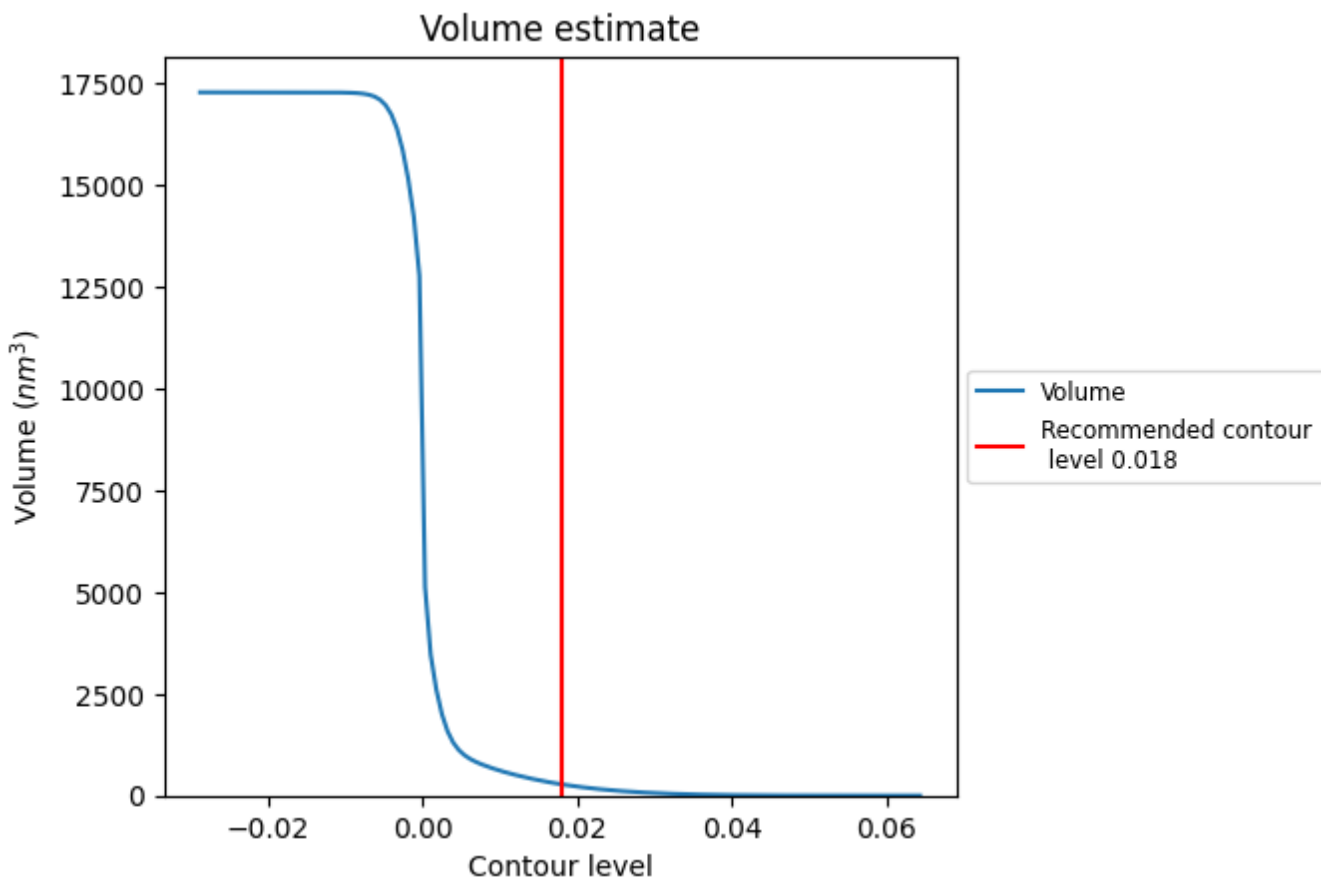
This section contains the results of statistical analysis of the map.

### 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.

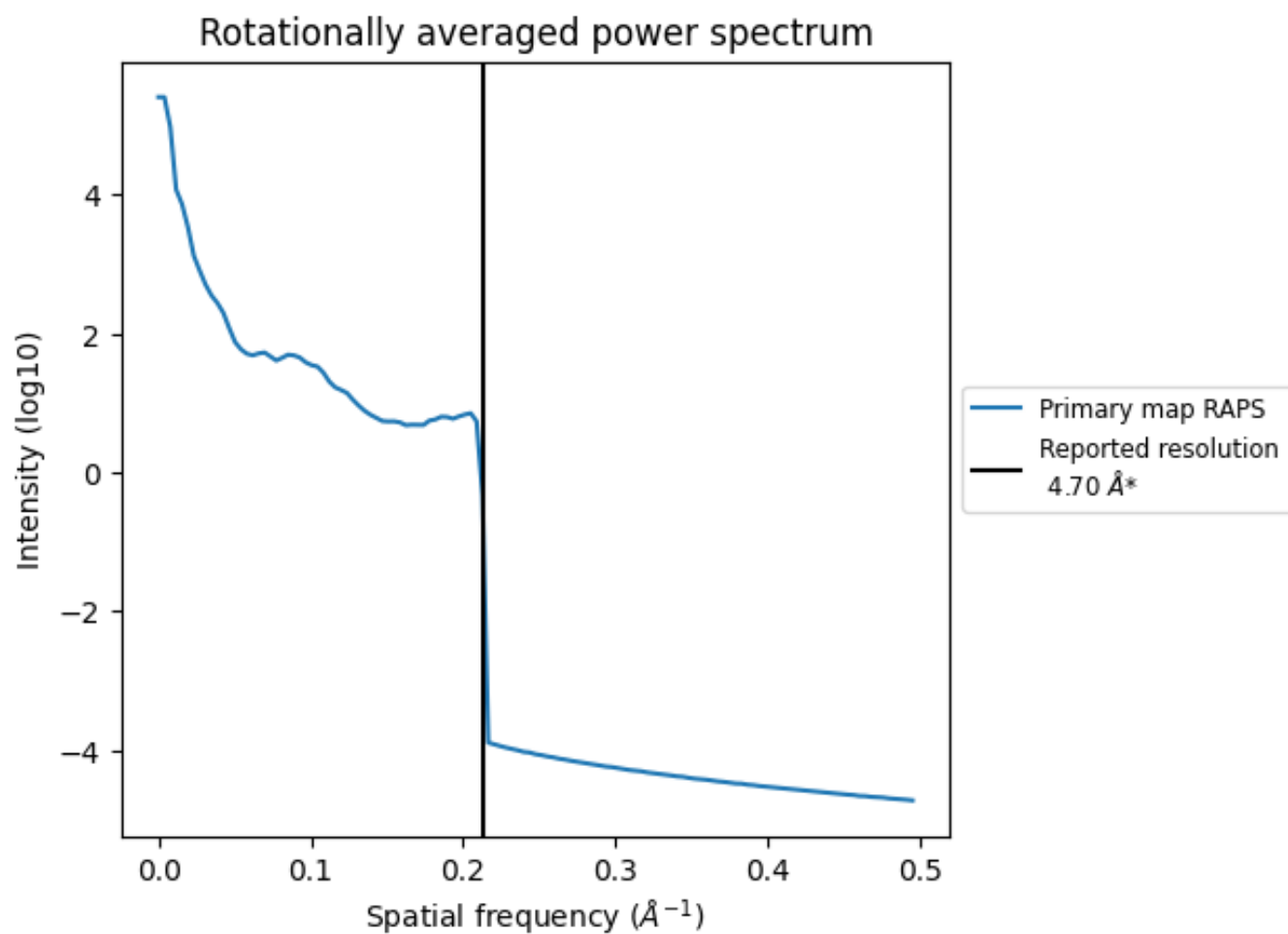
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 275 nm<sup>3</sup>; this corresponds to an approximate mass of 249 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  $0.213 \text{\AA}^{-1}$

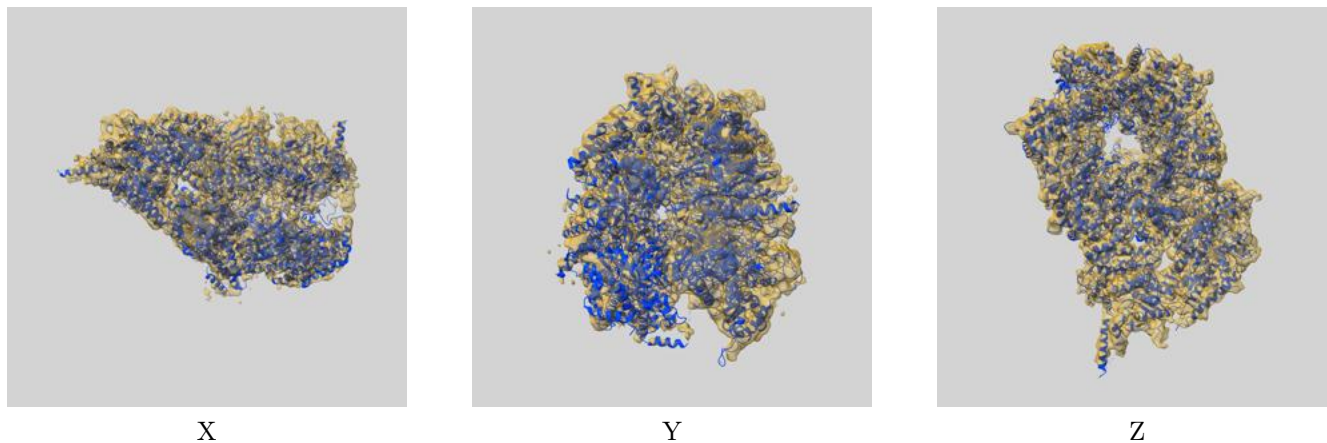
## 8 Fourier-Shell correlation

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

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

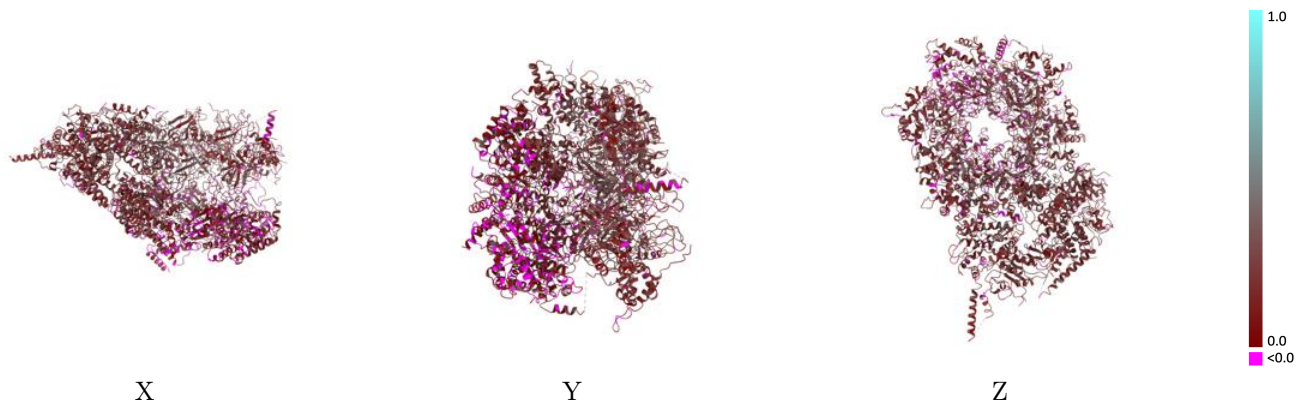
This section contains information regarding the fit between EMDB map EMD-6535 and PDB model 3JC5. Per-residue inclusion information can be found in section 3 on page 6.

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



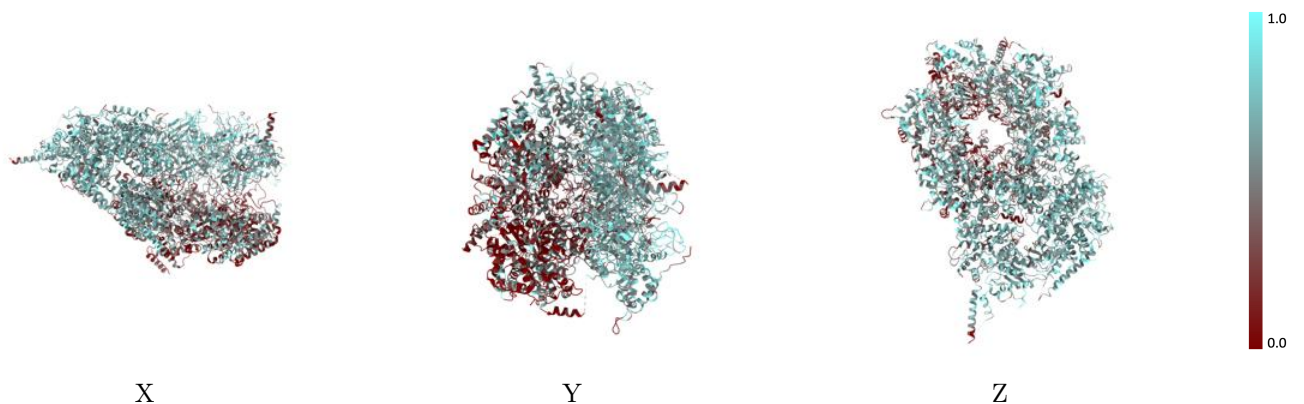
The images above show the 3D surface view of the map at the recommended contour level 0.018 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



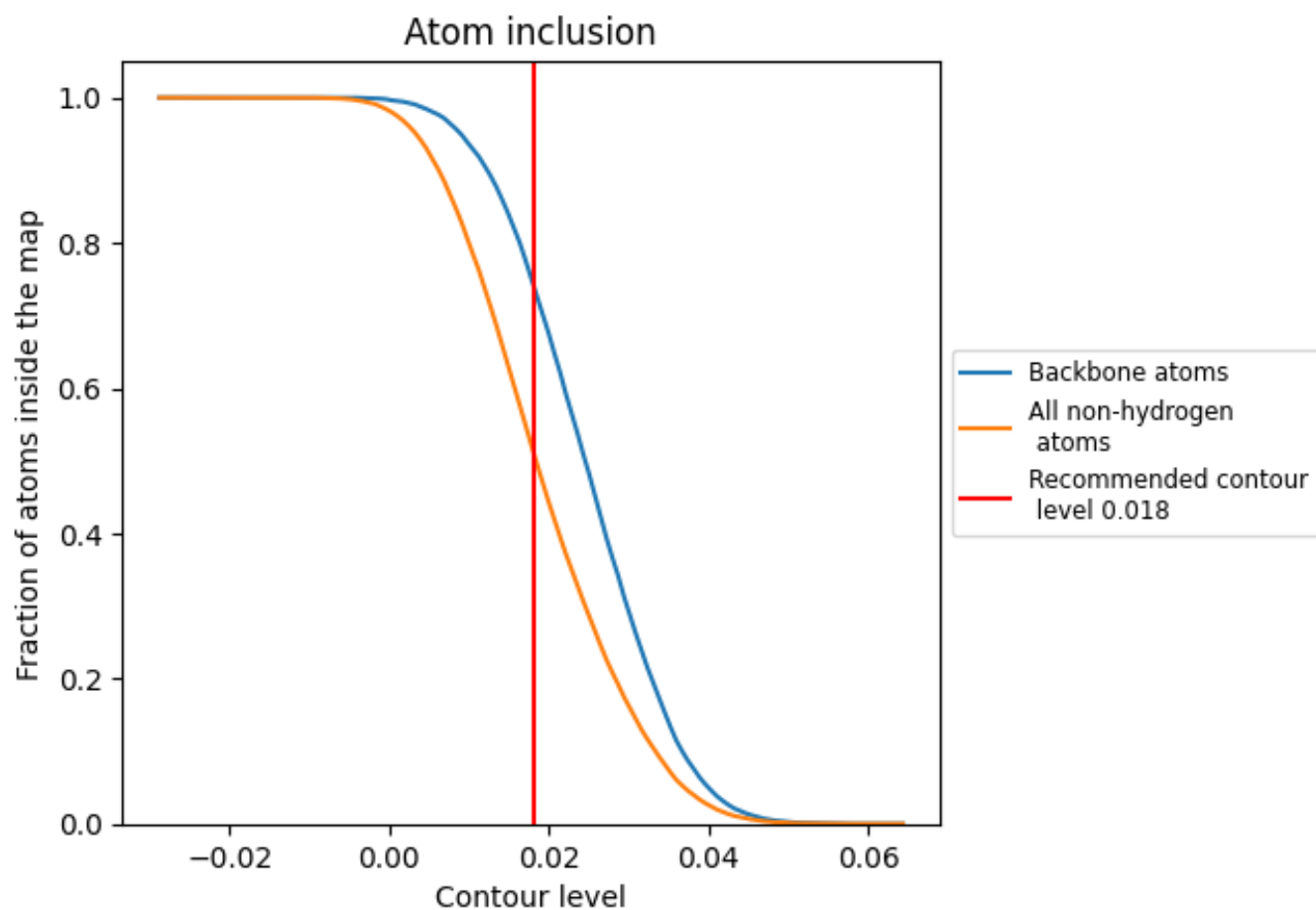
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.018).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 74% of all backbone atoms, 51% 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 (0.018) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.5128	0.1910
2	0.4766	0.1960
3	0.5353	0.1980
4	0.3852	0.1210
5	0.5028	0.2050
6	0.4427	0.1690
7	0.4681	0.1770
A	0.5825	0.2070
B	0.6528	0.2270
C	0.6562	0.2580
D	0.6659	0.2260
c	0.6227	0.2200

