



Full wwPDB EM Validation Report ⓘ

May 19, 2024 – 12:54 am BST

PDB ID : 6Z47
EMDB ID : EMD-11069
Title : Smooth muscle myosin shutdown state heads region
Authors : Scarff, C.A.; Carrington, G.; Casas Mao, D.; Chalovich, J.M.; Knight, P.J.;
Ranson, N.A.; Peckham, M.
Deposited on : 2020-05-22
Resolution : 6.30 Å(reported)

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

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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>.

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

EMDB validation analysis : 0.0.1.dev92
Mogul : 1.8.4, CSD as541be (2020)
MolProbity : 4.02b-467
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36.2

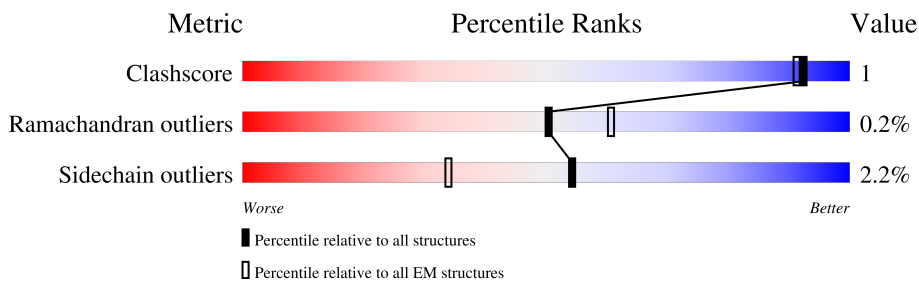
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 6.30 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	1979	42% 55%
1	B	1979	43% 55%
1	G	1979	12% 87%
1	H	1979	13% 87%
2	C	151	95%
2	D	151	99%
3	E	172	81% 13%
3	F	172	81% 5% 13%

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
5	ADP	A	2002	-	-	X	-
6	PO4	A	2003	-	-	X	-
6	PO4	B	2003	-	-	X	-

2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 23468 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 Myosin heavy chain 11.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	888	Total 7213	C 4572	N 1256	O 1350	S 35	0	0
1	B	888	Total 7213	C 4572	N 1256	O 1350	S 35	0	0
1	G	257	Total 2108	C 1278	N 382	O 441	S 7	0	0
1	H	257	Total 2108	C 1278	N 382	O 441	S 7	0	0

There are 184 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	249	GLY	PHE	conflict	UNP G1N5L2
A	250	LYS	VAL	conflict	UNP G1N5L2
A	251	PHE	LEU	conflict	UNP G1N5L2
A	252	ILE	LEU	conflict	UNP G1N5L2
A	253	ARG	LEU	conflict	UNP G1N5L2
A	?	-	CYS	deletion	UNP G1N5L2
A	254	ILE	LEU	conflict	UNP G1N5L2
A	255	ASN	HIS	conflict	UNP G1N5L2
A	257	ASP	GLN	conflict	UNP G1N5L2
A	259	THR	SER	conflict	UNP G1N5L2
A	260	GLY	PHE	conflict	UNP G1N5L2
A	261	TYR	LEU	conflict	UNP G1N5L2
A	263	VAL	TYR	conflict	UNP G1N5L2
A	264	GLY	ARG	conflict	UNP G1N5L2
A	265	ALA	SER	conflict	UNP G1N5L2
A	266	ASN	GLN	conflict	UNP G1N5L2
A	267	ILE	VAL	conflict	UNP G1N5L2
A	268	GLU	LEU	conflict	UNP G1N5L2
A	269	THR	SER	conflict	UNP G1N5L2
A	270	TYR	CYS	conflict	UNP G1N5L2
A	271	LEU	MET	conflict	UNP G1N5L2
A	272	LEU	GLY	conflict	UNP G1N5L2

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Chain	Residue	Modelled	Actual	Comment	Reference
A	273	GLU	GLN	conflict	UNP G1N5L2
A	274	LYS	SER	conflict	UNP G1N5L2
A	276	ARG	SER	conflict	UNP G1N5L2
A	277	ALA	LEU	conflict	UNP G1N5L2
A	278	ILE	SER	conflict	UNP G1N5L2
A	279	ARG	SER	conflict	UNP G1N5L2
A	280	GLN	THR	conflict	UNP G1N5L2
A	281	ALA	PHE	conflict	UNP G1N5L2
A	282	LYS	PRO	conflict	UNP G1N5L2
A	283	ASP	ASN	conflict	UNP G1N5L2
A	284	GLU	ILE	conflict	UNP G1N5L2
A	285	ARG	LYS	conflict	UNP G1N5L2
A	286	THR	ARG	conflict	UNP G1N5L2
A	288	HIS	GLU	conflict	UNP G1N5L2
A	289	ILE	THR	conflict	UNP G1N5L2
A	291	TYR	LEU	conflict	UNP G1N5L2
A	292	TYR	PHE	conflict	UNP G1N5L2
A	295	ALA	SER	conflict	UNP G1N5L2
A	296	GLY	ALA	conflict	UNP G1N5L2
A	297	ALA	VAL	conflict	UNP G1N5L2
A	298	SER	ARG	conflict	UNP G1N5L2
A	300	GLN	SER	conflict	UNP G1N5L2
A	301	MET	PHE	conflict	UNP G1N5L2
A	302	ARG	GLY	conflict	UNP G1N5L2
B	249	GLY	PHE	conflict	UNP G1N5L2
B	250	LYS	VAL	conflict	UNP G1N5L2
B	251	PHE	LEU	conflict	UNP G1N5L2
B	252	ILE	LEU	conflict	UNP G1N5L2
B	253	ARG	LEU	conflict	UNP G1N5L2
B	?	-	CYS	deletion	UNP G1N5L2
B	254	ILE	LEU	conflict	UNP G1N5L2
B	255	ASN	HIS	conflict	UNP G1N5L2
B	257	ASP	GLN	conflict	UNP G1N5L2
B	259	THR	SER	conflict	UNP G1N5L2
B	260	GLY	PHE	conflict	UNP G1N5L2
B	261	TYR	LEU	conflict	UNP G1N5L2
B	263	VAL	TYR	conflict	UNP G1N5L2
B	264	GLY	ARG	conflict	UNP G1N5L2
B	265	ALA	SER	conflict	UNP G1N5L2
B	266	ASN	GLN	conflict	UNP G1N5L2
B	267	ILE	VAL	conflict	UNP G1N5L2
B	268	GLU	LEU	conflict	UNP G1N5L2

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Chain	Residue	Modelled	Actual	Comment	Reference
B	269	THR	SER	conflict	UNP G1N5L2
B	270	TYR	CYS	conflict	UNP G1N5L2
B	271	LEU	MET	conflict	UNP G1N5L2
B	272	LEU	GLY	conflict	UNP G1N5L2
B	273	GLU	GLN	conflict	UNP G1N5L2
B	274	LYS	SER	conflict	UNP G1N5L2
B	276	ARG	SER	conflict	UNP G1N5L2
B	277	ALA	LEU	conflict	UNP G1N5L2
B	278	ILE	SER	conflict	UNP G1N5L2
B	279	ARG	SER	conflict	UNP G1N5L2
B	280	GLN	THR	conflict	UNP G1N5L2
B	281	ALA	PHE	conflict	UNP G1N5L2
B	282	LYS	PRO	conflict	UNP G1N5L2
B	283	ASP	ASN	conflict	UNP G1N5L2
B	284	GLU	ILE	conflict	UNP G1N5L2
B	285	ARG	LYS	conflict	UNP G1N5L2
B	286	THR	ARG	conflict	UNP G1N5L2
B	288	HIS	GLU	conflict	UNP G1N5L2
B	289	ILE	THR	conflict	UNP G1N5L2
B	291	TYR	LEU	conflict	UNP G1N5L2
B	292	TYR	PHE	conflict	UNP G1N5L2
B	295	ALA	SER	conflict	UNP G1N5L2
B	296	GLY	ALA	conflict	UNP G1N5L2
B	297	ALA	VAL	conflict	UNP G1N5L2
B	298	SER	ARG	conflict	UNP G1N5L2
B	300	GLN	SER	conflict	UNP G1N5L2
B	301	MET	PHE	conflict	UNP G1N5L2
B	302	ARG	GLY	conflict	UNP G1N5L2
G	249	GLY	PHE	conflict	UNP G1N5L2
G	250	LYS	VAL	conflict	UNP G1N5L2
G	251	PHE	LEU	conflict	UNP G1N5L2
G	252	ILE	LEU	conflict	UNP G1N5L2
G	253	ARG	LEU	conflict	UNP G1N5L2
G	?	-	CYS	deletion	UNP G1N5L2
G	254	ILE	LEU	conflict	UNP G1N5L2
G	255	ASN	HIS	conflict	UNP G1N5L2
G	257	ASP	GLN	conflict	UNP G1N5L2
G	259	THR	SER	conflict	UNP G1N5L2
G	260	GLY	PHE	conflict	UNP G1N5L2
G	261	TYR	LEU	conflict	UNP G1N5L2
G	263	VAL	TYR	conflict	UNP G1N5L2
G	264	GLY	ARG	conflict	UNP G1N5L2

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Chain	Residue	Modelled	Actual	Comment	Reference
G	265	ALA	SER	conflict	UNP G1N5L2
G	266	ASN	GLN	conflict	UNP G1N5L2
G	267	ILE	VAL	conflict	UNP G1N5L2
G	268	GLU	LEU	conflict	UNP G1N5L2
G	269	THR	SER	conflict	UNP G1N5L2
G	270	TYR	CYS	conflict	UNP G1N5L2
G	271	LEU	MET	conflict	UNP G1N5L2
G	272	LEU	GLY	conflict	UNP G1N5L2
G	273	GLU	GLN	conflict	UNP G1N5L2
G	274	LYS	SER	conflict	UNP G1N5L2
G	276	ARG	SER	conflict	UNP G1N5L2
G	277	ALA	LEU	conflict	UNP G1N5L2
G	278	ILE	SER	conflict	UNP G1N5L2
G	279	ARG	SER	conflict	UNP G1N5L2
G	280	GLN	THR	conflict	UNP G1N5L2
G	281	ALA	PHE	conflict	UNP G1N5L2
G	282	LYS	PRO	conflict	UNP G1N5L2
G	283	ASP	ASN	conflict	UNP G1N5L2
G	284	GLU	ILE	conflict	UNP G1N5L2
G	285	ARG	LYS	conflict	UNP G1N5L2
G	286	THR	ARG	conflict	UNP G1N5L2
G	288	HIS	GLU	conflict	UNP G1N5L2
G	289	ILE	THR	conflict	UNP G1N5L2
G	291	TYR	LEU	conflict	UNP G1N5L2
G	292	TYR	PHE	conflict	UNP G1N5L2
G	295	ALA	SER	conflict	UNP G1N5L2
G	296	GLY	ALA	conflict	UNP G1N5L2
G	297	ALA	VAL	conflict	UNP G1N5L2
G	298	SER	ARG	conflict	UNP G1N5L2
G	300	GLN	SER	conflict	UNP G1N5L2
G	301	MET	PHE	conflict	UNP G1N5L2
G	302	ARG	GLY	conflict	UNP G1N5L2
H	249	GLY	PHE	conflict	UNP G1N5L2
H	250	LYS	VAL	conflict	UNP G1N5L2
H	251	PHE	LEU	conflict	UNP G1N5L2
H	252	ILE	LEU	conflict	UNP G1N5L2
H	253	ARG	LEU	conflict	UNP G1N5L2
H	?	-	CYS	deletion	UNP G1N5L2
H	254	ILE	LEU	conflict	UNP G1N5L2
H	255	ASN	HIS	conflict	UNP G1N5L2
H	257	ASP	GLN	conflict	UNP G1N5L2
H	259	THR	SER	conflict	UNP G1N5L2

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Chain	Residue	Modelled	Actual	Comment	Reference
H	260	GLY	PHE	conflict	UNP G1N5L2
H	261	TYR	LEU	conflict	UNP G1N5L2
H	263	VAL	TYR	conflict	UNP G1N5L2
H	264	GLY	ARG	conflict	UNP G1N5L2
H	265	ALA	SER	conflict	UNP G1N5L2
H	266	ASN	GLN	conflict	UNP G1N5L2
H	267	ILE	VAL	conflict	UNP G1N5L2
H	268	GLU	LEU	conflict	UNP G1N5L2
H	269	THR	SER	conflict	UNP G1N5L2
H	270	TYR	CYS	conflict	UNP G1N5L2
H	271	LEU	MET	conflict	UNP G1N5L2
H	272	LEU	GLY	conflict	UNP G1N5L2
H	273	GLU	GLN	conflict	UNP G1N5L2
H	274	LYS	SER	conflict	UNP G1N5L2
H	276	ARG	SER	conflict	UNP G1N5L2
H	277	ALA	LEU	conflict	UNP G1N5L2
H	278	ILE	SER	conflict	UNP G1N5L2
H	279	ARG	SER	conflict	UNP G1N5L2
H	280	GLN	THR	conflict	UNP G1N5L2
H	281	ALA	PHE	conflict	UNP G1N5L2
H	282	LYS	PRO	conflict	UNP G1N5L2
H	283	ASP	ASN	conflict	UNP G1N5L2
H	284	GLU	ILE	conflict	UNP G1N5L2
H	285	ARG	LYS	conflict	UNP G1N5L2
H	286	THR	ARG	conflict	UNP G1N5L2
H	288	HIS	GLU	conflict	UNP G1N5L2
H	289	ILE	THR	conflict	UNP G1N5L2
H	291	TYR	LEU	conflict	UNP G1N5L2
H	292	TYR	PHE	conflict	UNP G1N5L2
H	295	ALA	SER	conflict	UNP G1N5L2
H	296	GLY	ALA	conflict	UNP G1N5L2
H	297	ALA	VAL	conflict	UNP G1N5L2
H	298	SER	ARG	conflict	UNP G1N5L2
H	300	GLN	SER	conflict	UNP G1N5L2
H	301	MET	PHE	conflict	UNP G1N5L2
H	302	ARG	GLY	conflict	UNP G1N5L2

- Molecule 2 is a protein called Myosin light chain smooth muscle isoform.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	C	150	1174	727	195	240	12	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	D	150	1174	727	195	240	12	0	0

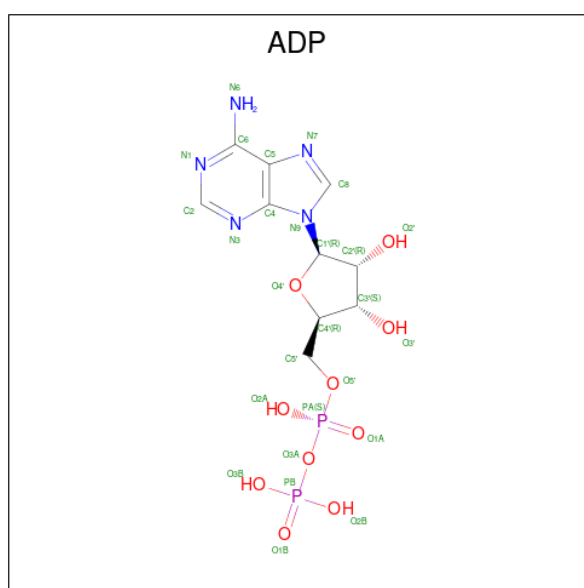
- Molecule 3 is a protein called Myosin light chain 9.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	E	149	1205	756	196	242	11	0	0
3	F	149	1205	756	196	242	11	0	0

- Molecule 4 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

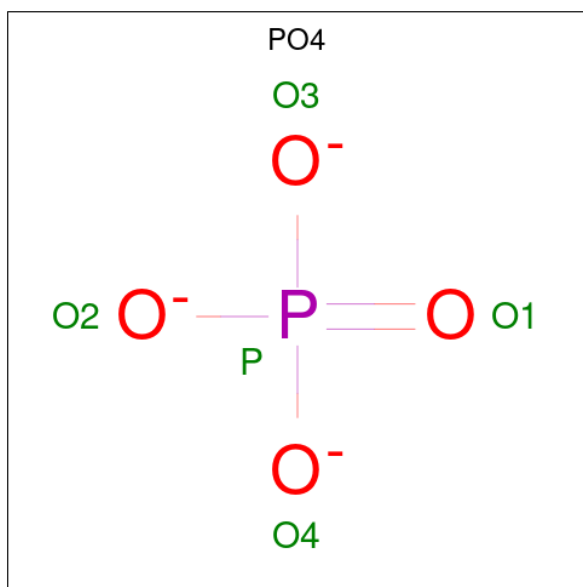
Mol	Chain	Residues	Atoms		AltConf
			Total	Mg	
4	A	1	1	1	0
4	B	1	1	1	0
4	E	1	1	1	0
4	F	1	1	1	0

- Molecule 5 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂).

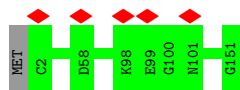


Mol	Chain	Residues	Atoms					AltConf
			Total	C	N	O	P	
5	A	1	27	10	5	10	2	0
5	B	1	27	10	5	10	2	0

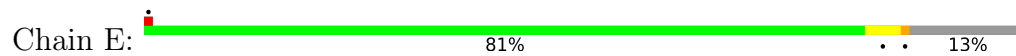
- Molecule 6 is PHOSPHATE ION (three-letter code: PO4) (formula: O₄P).



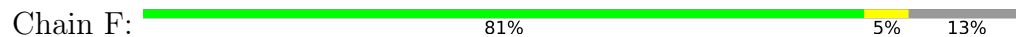
Mol	Chain	Residues	Atoms			AltConf
			Total	O	P	
6	A	1	5	4	1	0
6	B	1	5	4	1	0



• Molecule 3: Myosin light chain 9



• Molecule 3: Myosin light chain 9



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	96351	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)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 QUANTUM (4k x 4k)	Depositor
Maximum map value	1.671	Depositor
Minimum map value	-0.537	Depositor
Average map value	0.006	Depositor
Map value standard deviation	0.049	Depositor
Recommended contour level	0.28	Depositor
Map size (Å)	376.64, 376.64, 376.64	wwPDB
Map dimensions	352, 352, 352	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.07, 1.07, 1.07	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: ADP, PO4, MG

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.35	0/7339	0.58	0/9875
1	B	0.35	0/7339	0.58	0/9875
1	G	0.34	0/2115	0.51	0/2814
1	H	0.33	0/2115	0.49	0/2814
2	C	0.31	0/1189	0.55	0/1594
2	D	0.31	0/1189	0.51	0/1594
3	E	0.35	0/1230	0.61	0/1651
3	F	0.35	0/1230	0.58	0/1651
All	All	0.34	0/23746	0.56	0/31868

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	A	7213	0	7252	34	0
1	B	7213	0	7251	18	0
1	G	2108	0	2115	5	0
1	H	2108	0	2115	5	0
2	C	1174	0	1128	3	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	D	1174	0	1128	0	0
3	E	1205	0	1119	4	0
3	F	1205	0	1119	2	0
4	A	1	0	0	0	0
4	B	1	0	0	0	0
4	E	1	0	0	0	0
4	F	1	0	0	0	0
5	A	27	0	12	17	0
5	B	27	0	12	7	0
6	A	5	0	0	4	0
6	B	5	0	0	5	0
All	All	23468	0	23251	64	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 1.

All (64) 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:179:SER:O	6:A:2003:PO4:O3	1.70	1.08
1:A:242:ASN:ND2	5:A:2002:ADP:O1B	2.10	0.83
1:B:242:ASN:ND2	6:B:2003:PO4:O1	2.11	0.83
1:B:242:ASN:ND2	5:B:2002:ADP:O1B	2.14	0.81
1:B:184:THR:OG1	5:B:2002:ADP:O2B	1.98	0.81
1:A:179:SER:O	5:A:2002:ADP:O1B	2.00	0.78
5:B:2002:ADP:O1B	6:B:2003:PO4:P	2.42	0.76
1:A:182:GLY:HA2	5:A:2002:ADP:PA	2.31	0.70
1:B:245:SER:HA	6:B:2003:PO4:O1	1.91	0.69
1:A:127:TYR:HA	5:A:2002:ADP:H1'	1.75	0.67
1:A:126:PRO:HD2	5:A:2002:ADP:C5	2.35	0.62
1:B:182:GLY:HA2	5:B:2002:ADP:PA	2.42	0.60
1:A:179:SER:HA	6:A:2003:PO4:O2	2.01	0.60
1:B:246:SER:H	6:B:2003:PO4:P	2.26	0.58
5:A:2002:ADP:O1B	6:A:2003:PO4:O3	2.21	0.58
1:B:327:GLN:HA	1:B:327:GLN:HE21	1.68	0.57
1:B:183:LYS:NZ	5:B:2002:ADP:O3B	2.36	0.55
1:A:125:ASN:OD1	5:A:2002:ADP:O4'	2.24	0.55
1:A:132:ILE:HG22	1:A:132:ILE:O	2.07	0.53
1:A:125:ASN:OD1	5:A:2002:ADP:C1'	2.56	0.53
1:A:182:GLY:HA2	5:A:2002:ADP:O3A	2.08	0.53
1:A:179:SER:O	6:A:2003:PO4:P	2.67	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:182:GLY:H	5:A:2002:ADP:PB	2.33	0.51
1:A:182:GLY:CA	5:A:2002:ADP:O3A	2.59	0.50
1:A:126:PRO:HD2	5:A:2002:ADP:C4	2.46	0.50
5:B:2002:ADP:O1B	6:B:2003:PO4:O2	2.29	0.50
1:A:125:ASN:OD1	5:A:2002:ADP:C8	2.66	0.49
1:G:1611:LEU:CB	1:H:1611:LEU:HD23	2.43	0.49
3:E:146:ALA:HB1	3:E:147:PRO:HD2	1.95	0.48
1:A:126:PRO:HD2	5:A:2002:ADP:C8	2.49	0.48
1:A:158:ASP:O	1:A:162:ARG:HG2	2.15	0.47
1:A:870:THR:HG23	1:B:874:GLN:OE1	2.15	0.47
1:A:800:GLN:NE2	2:C:118:GLU:O	2.46	0.47
1:A:874:GLN:O	1:A:878:GLU:HG2	2.14	0.47
1:A:433:ALA:O	1:A:436:GLU:HG3	2.16	0.46
1:A:125:ASN:HD21	5:A:2002:ADP:C5'	2.29	0.45
1:A:848:LYS:N	1:A:849:PRO:HD2	2.32	0.45
1:A:182:GLY:N	5:A:2002:ADP:O3A	2.49	0.45
1:B:313:TYR:CZ	1:B:360:LEU:HD21	2.52	0.44
1:A:851:LEU:HD22	3:E:36:GLU:HG3	1.99	0.44
1:B:696:LEU:HD11	1:B:701:VAL:HG11	1.99	0.44
1:A:125:ASN:ND2	5:A:2002:ADP:O4'	2.52	0.43
1:A:603:ASP:N	1:A:604:PRO:HD3	2.34	0.43
1:A:800:GLN:HE21	2:C:120:MET:HG3	1.83	0.43
1:B:436:GLU:HA	1:B:439:PHE:CE2	2.53	0.43
3:E:49:ILE:HG23	3:E:54:LEU:CD2	2.49	0.43
1:A:792:ILE:HG22	1:A:796:ILE:HG12	1.99	0.43
1:B:533:ASN:HB3	1:B:534:PRO:HD2	2.01	0.43
1:G:1613:ASP:HA	1:G:1616:LYS:HE3	2.01	0.43
1:A:792:ILE:HG21	2:C:96:PHE:CZ	2.54	0.43
1:G:1611:LEU:HB3	1:H:1611:LEU:HD23	2.00	0.43
1:G:1628:LEU:HD12	1:H:1625:LYS:HG2	2.02	0.42
1:A:102:HIS:HA	1:A:105:ARG:HG2	2.02	0.42
1:B:182:GLY:HA2	5:B:2002:ADP:O5'	2.20	0.42
3:F:116:GLY:HA2	3:F:156:TYR:CZ	2.55	0.42
3:F:146:ALA:HB1	3:F:147:PRO:CD	2.50	0.42
3:E:105:ASN:CG	1:H:1577:ALA:HB2	2.41	0.42
1:A:613:LEU:HD23	1:A:625:TRP:CE2	2.55	0.41
1:B:94:CYS:SG	1:B:95:LEU:N	2.88	0.41
1:B:352:ILE:HD11	1:B:441:TRP:CZ3	2.56	0.41
1:B:610:THR:HG21	1:B:631:ILE:HD11	2.02	0.41
1:B:533:ASN:O	1:B:534:PRO:C	2.57	0.40
1:G:1438:LEU:HD22	1:H:1442:LEU:CD1	2.51	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:406:ARG:HG2	1:A:413:VAL:HG22	2.03	0.40

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	882/1979 (45%)	855 (97%)	24 (3%)	3 (0%)	41	76
1	B	882/1979 (45%)	842 (96%)	38 (4%)	2 (0%)	47	81
1	G	255/1979 (13%)	253 (99%)	2 (1%)	0	100	100
1	H	255/1979 (13%)	254 (100%)	1 (0%)	0	100	100
2	C	148/151 (98%)	142 (96%)	5 (3%)	1 (1%)	22	63
2	D	148/151 (98%)	139 (94%)	9 (6%)	0	100	100
3	E	147/172 (86%)	139 (95%)	8 (5%)	0	100	100
3	F	147/172 (86%)	135 (92%)	11 (8%)	1 (1%)	22	63
All	All	2864/8562 (34%)	2759 (96%)	98 (3%)	7 (0%)	50	81

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	564	GLY
1	A	87	GLU
1	B	297	ALA
1	A	853	VAL
2	C	54	ASN
1	B	531	PRO
3	F	22	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	A	782/1746 (45%)	765 (98%)	17 (2%)	52	71
1	B	782/1746 (45%)	761 (97%)	21 (3%)	44	65
1	G	229/1746 (13%)	222 (97%)	7 (3%)	40	62
1	H	229/1746 (13%)	229 (100%)	0	100	100
2	C	129/130 (99%)	127 (98%)	2 (2%)	62	79
2	D	129/130 (99%)	129 (100%)	0	100	100
3	E	130/150 (87%)	125 (96%)	5 (4%)	33	57
3	F	130/150 (87%)	126 (97%)	4 (3%)	40	62
All	All	2540/7544 (34%)	2484 (98%)	56 (2%)	54	71

All (56) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	75	ILE
1	A	164	MET
1	A	178	GLU
1	A	191	ILE
1	A	220	LEU
1	A	250	LYS
1	A	371	ARG
1	A	436	GLU
1	A	443	LEU
1	A	456	GLN
1	A	529	GLU
1	A	577	ASP
1	A	658	THR
1	A	703	GLU
1	A	718	ARG
1	A	836	ARG
1	A	840	TRP
1	B	50	LYS
1	B	53	LYS

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Mol	Chain	Res	Type
1	B	128	LYS
1	B	145	LYS
1	B	149	MET
1	B	168	ARG
1	B	173	ILE
1	B	178	GLU
1	B	228	ASN
1	B	238	LYS
1	B	327	GLN
1	B	360	LEU
1	B	371	ARG
1	B	411	ARG
1	B	607	ASP
1	B	700	LEU
1	B	760	LEU
1	B	788	ARG
1	B	836	ARG
1	B	855	ARG
1	B	933	MET
2	C	20	ASP
2	C	52	LEU
3	E	45	ARG
3	E	54	LEU
3	E	105	ASN
3	E	110	PHE
3	E	112	GLU
3	F	43	GLN
3	F	44	ASN
3	F	49	ILE
3	F	120	GLU
1	G	1485	ARG
1	G	1537	GLU
1	G	1540	LYS
1	G	1554	LEU
1	G	1578	MET
1	G	1584	ARG
1	G	1625	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	62	GLN

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Mol	Chain	Res	Type
1	B	327	GLN
1	B	723	ASN
3	E	55	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](#)

Of 8 ligands modelled in this entry, 4 are monoatomic - leaving 4 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	PO4	A	2003	4	4,4,4	0.74	0	6,6,6	0.46	0
5	ADP	A	2002	4	24,29,29	0.68	0	29,45,45	0.78	0
6	PO4	B	2003	4	4,4,4	1.95	1 (25%)	6,6,6	1.18	1 (16%)
5	ADP	B	2002	4	24,29,29	0.91	0	29,45,45	0.79	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
5	ADP	A	2002	4	-	3/12/32/32	0/3/3/3
5	ADP	B	2002	4	-	3/12/32/32	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	B	2003	PO4	P-O1	3.49	1.59	1.50

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	B	2003	PO4	O3-P-O1	-2.07	103.34	110.89

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	2002	ADP	C5'-O5'-PA-O1A
5	B	2002	ADP	C5'-O5'-PA-O1A
5	A	2002	ADP	C5'-O5'-PA-O3A
5	B	2002	ADP	C5'-O5'-PA-O3A
5	A	2002	ADP	C5'-O5'-PA-O2A
5	B	2002	ADP	C5'-O5'-PA-O2A

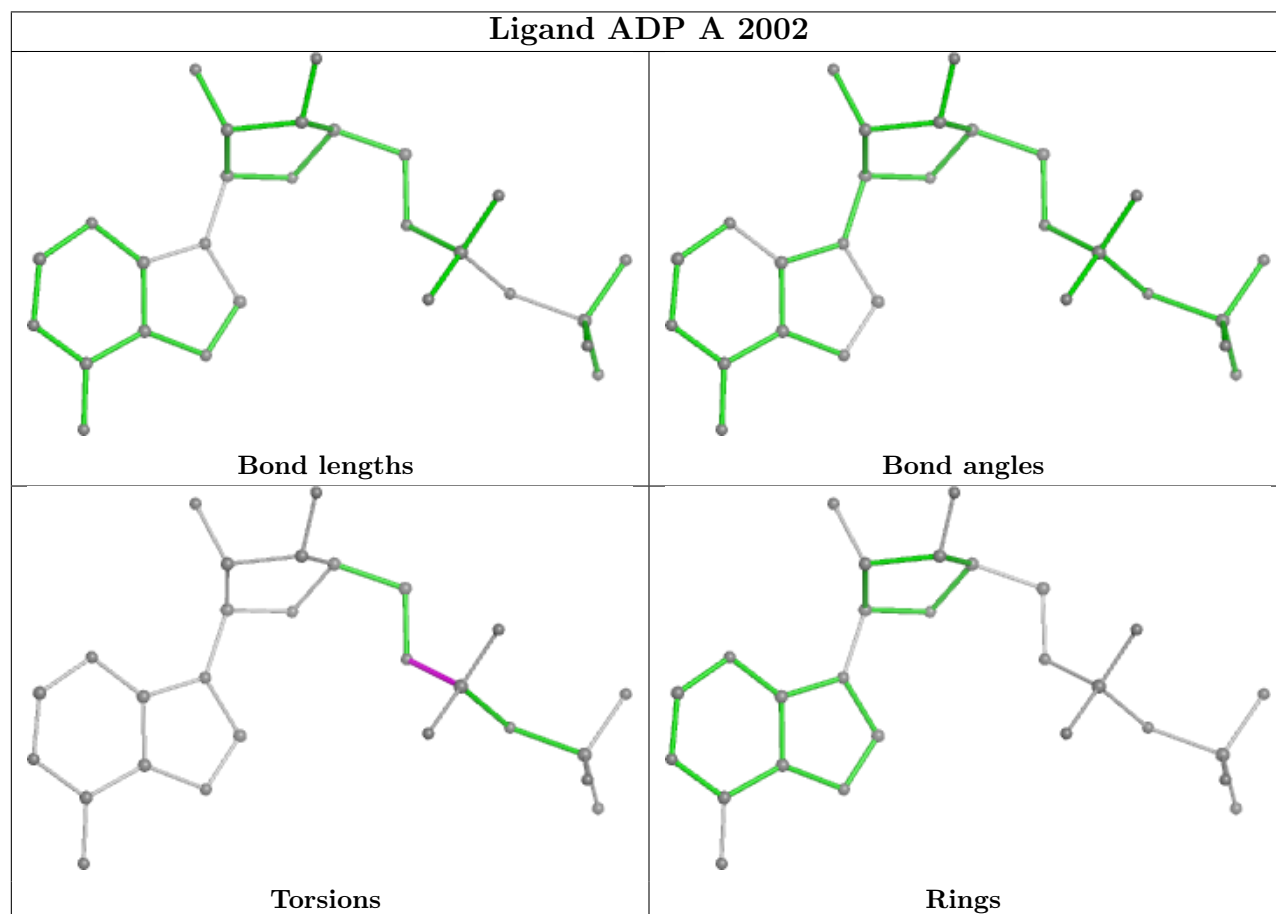
There are no ring outliers.

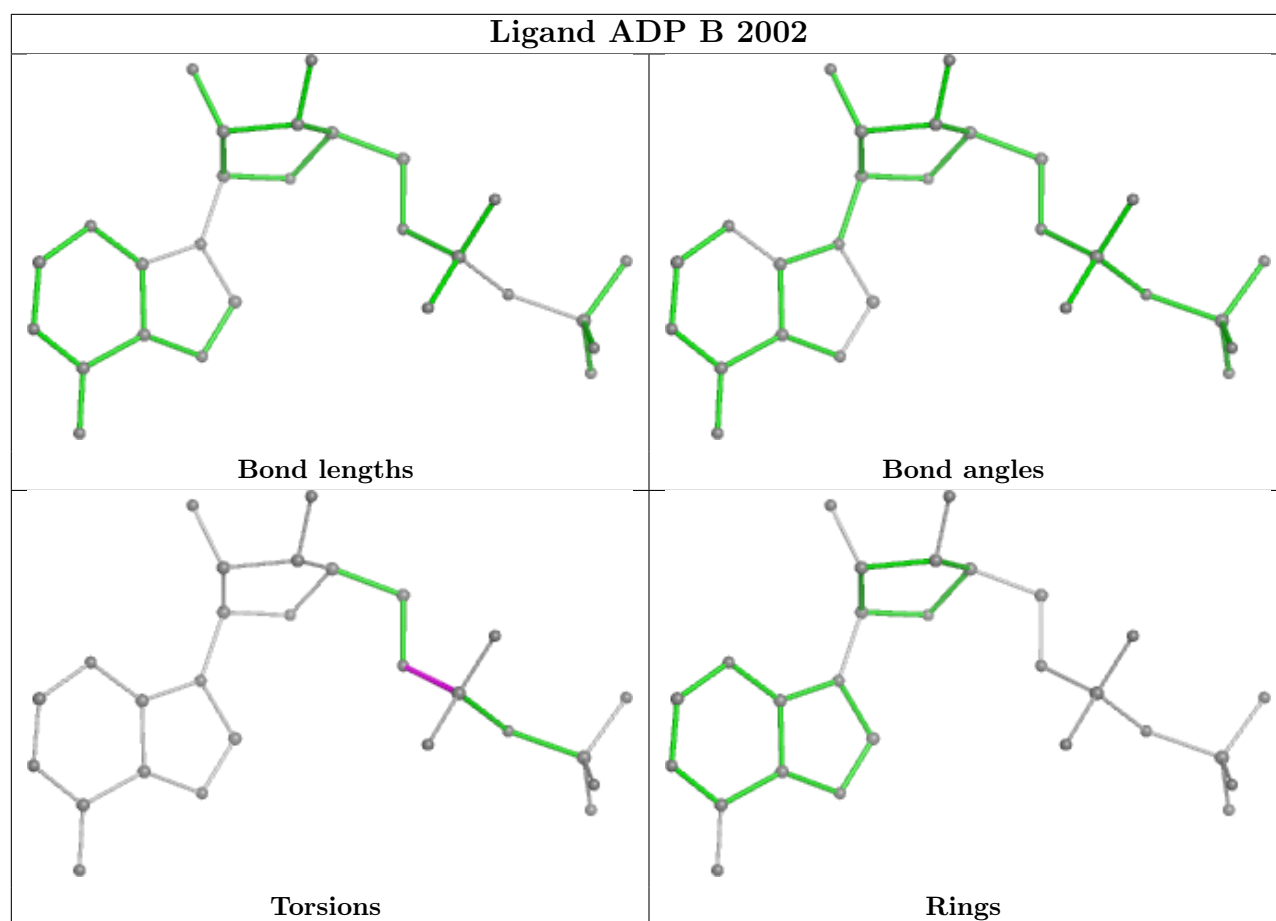
4 monomers are involved in 30 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	A	2003	PO4	4	0
5	A	2002	ADP	17	0
6	B	2003	PO4	5	0
5	B	2002	ADP	7	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-11069. These allow visual inspection of the internal detail of the map and identification of artifacts.

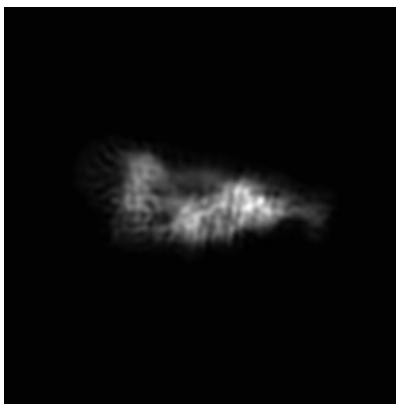
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

6.1.1 Primary map



X

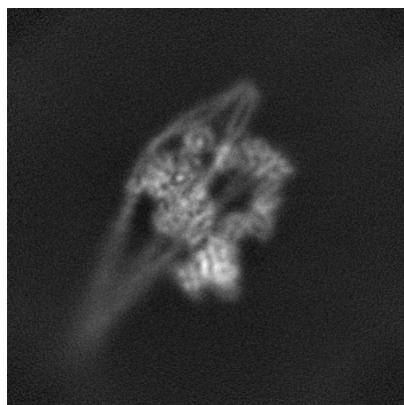


Y

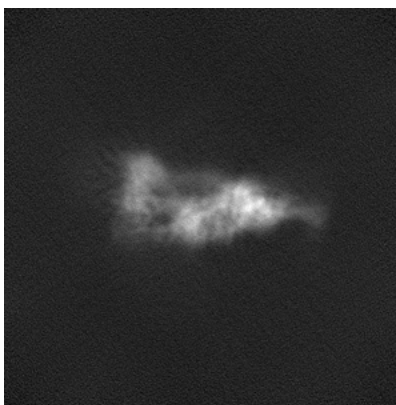


Z

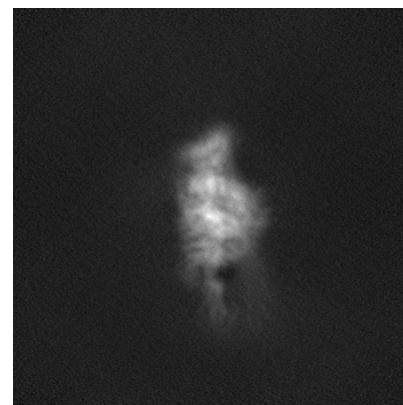
6.1.2 Raw map



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: 176

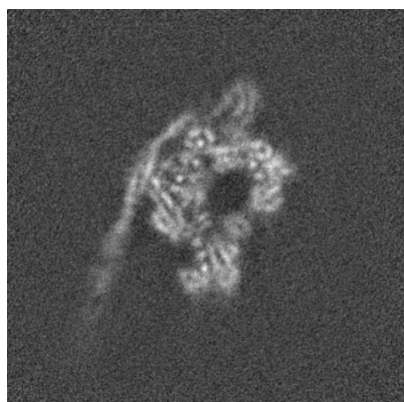


Y Index: 176

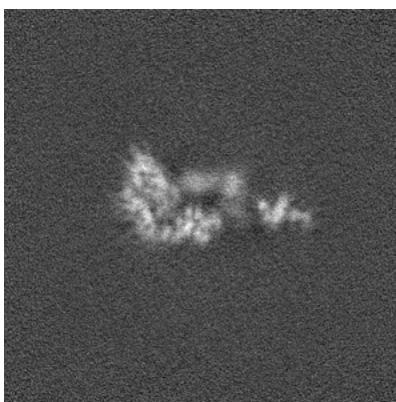


Z Index: 176

6.2.2 Raw map



X Index: 176



Y Index: 176



Z Index: 176

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

6.3 Largest variance slices [i](#)

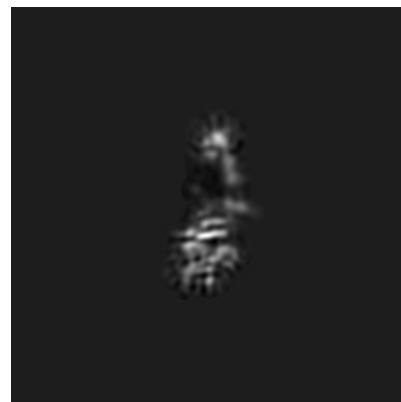
6.3.1 Primary map



X Index: 173

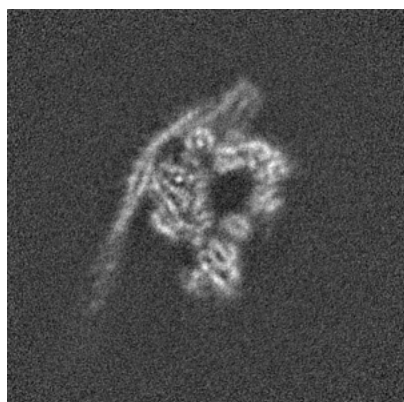


Y Index: 168

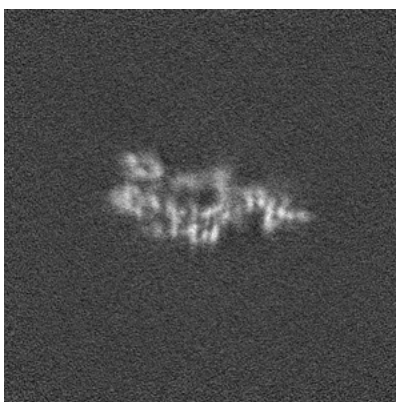


Z Index: 202

6.3.2 Raw map



X Index: 173



Y Index: 168



Z Index: 215

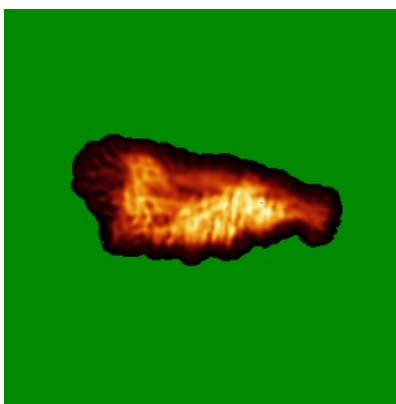
The images above show the largest variance slices of the map in three orthogonal directions.

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

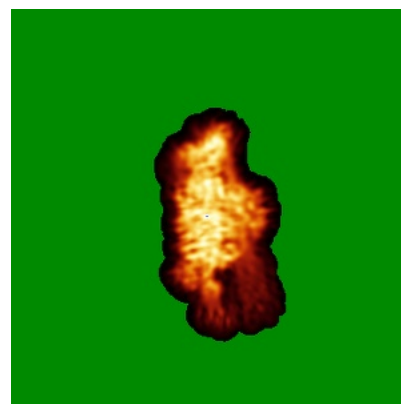
6.4.1 Primary map



X

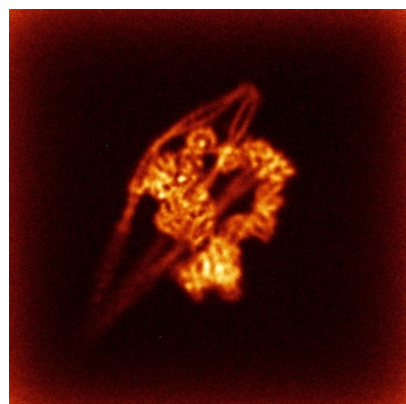


Y

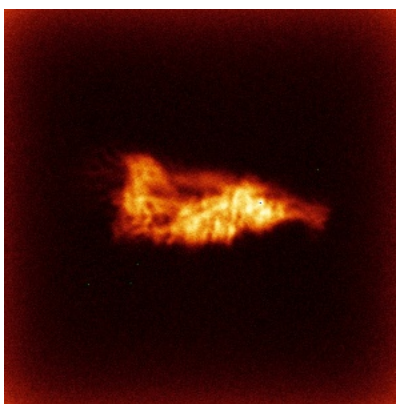


Z

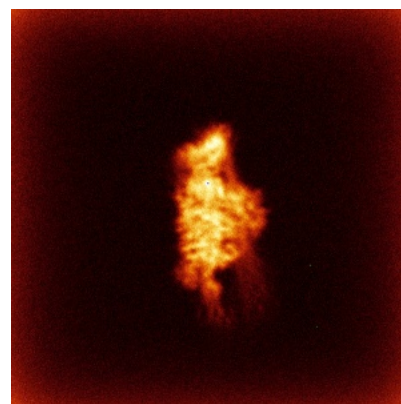
6.4.2 Raw map



X



Y

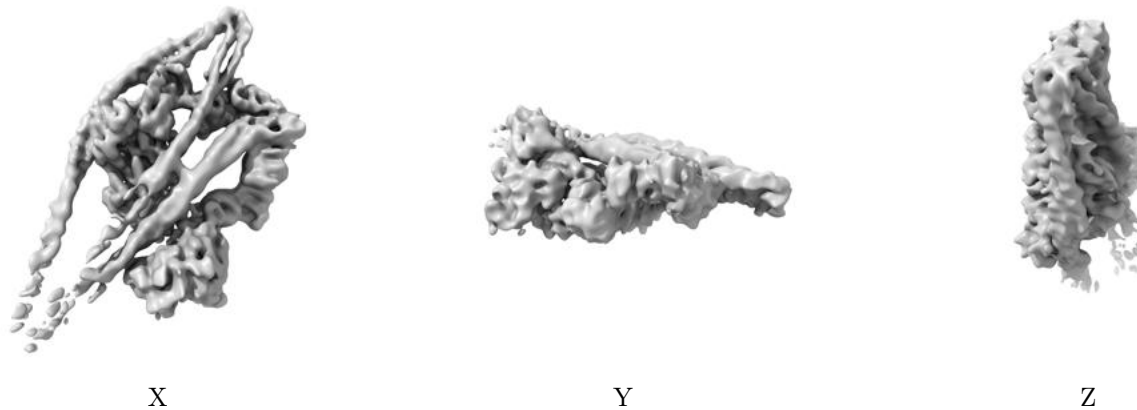


Z

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 0.28. 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.

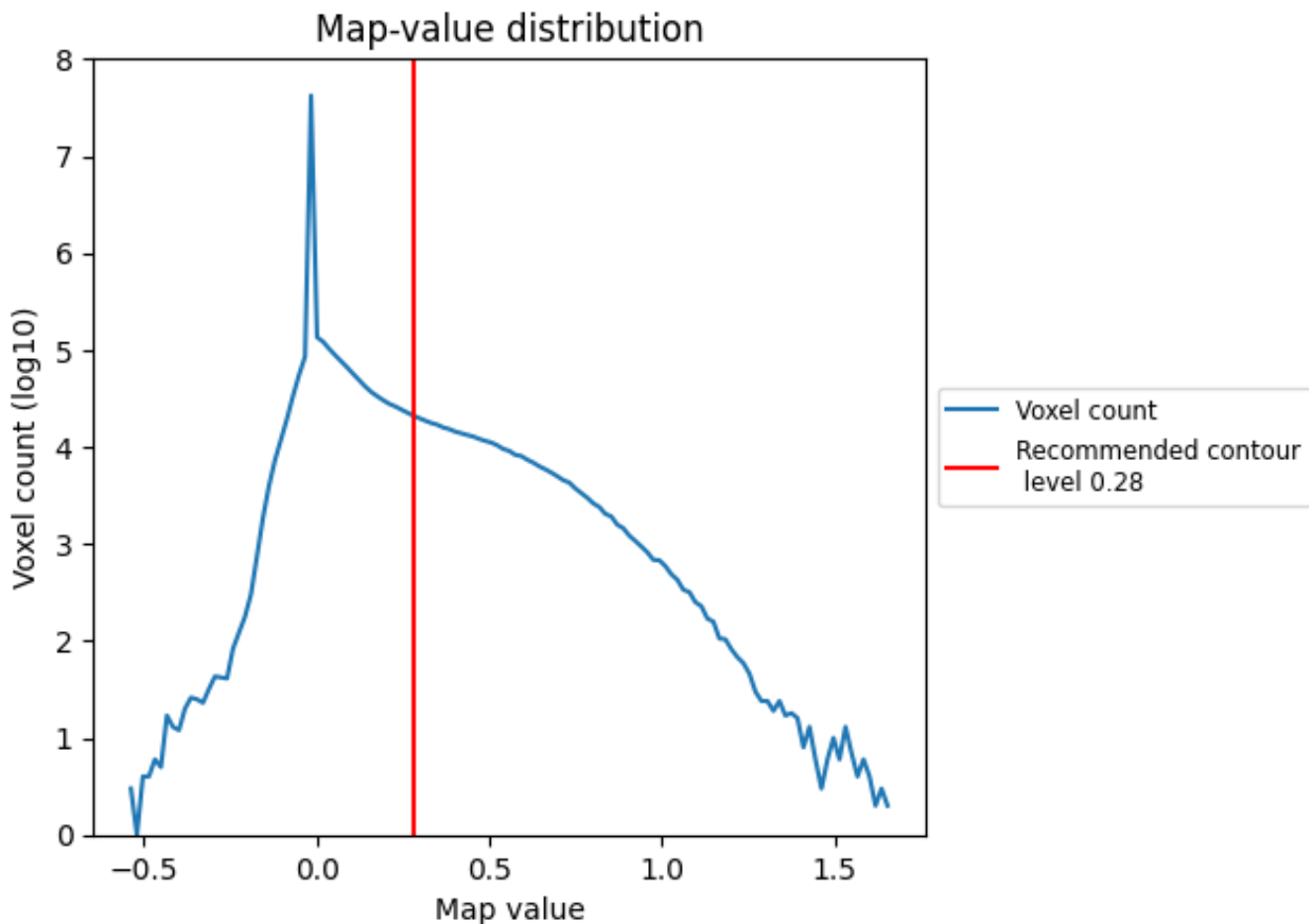
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

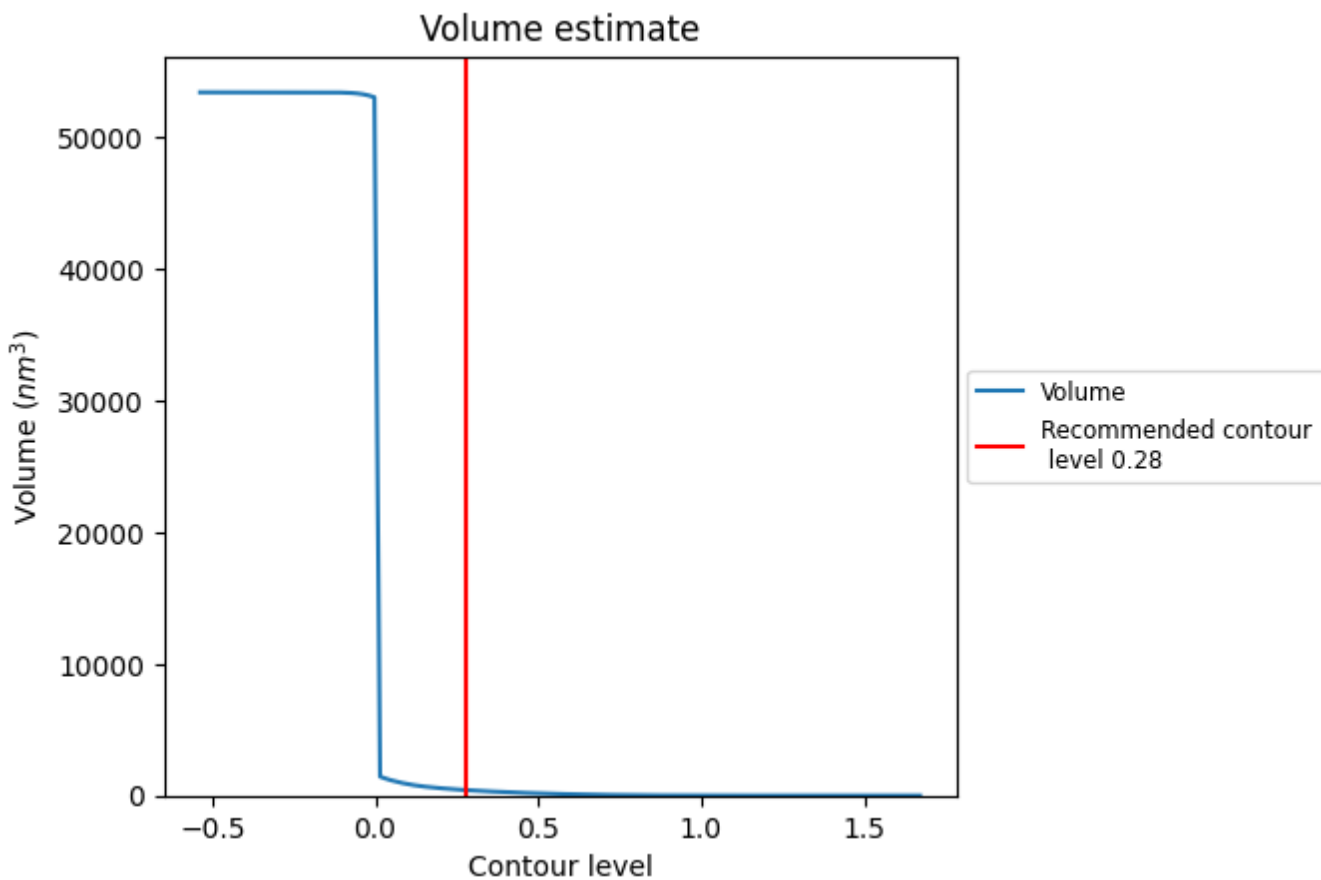
This section contains the results of statistical analysis of the map.

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.

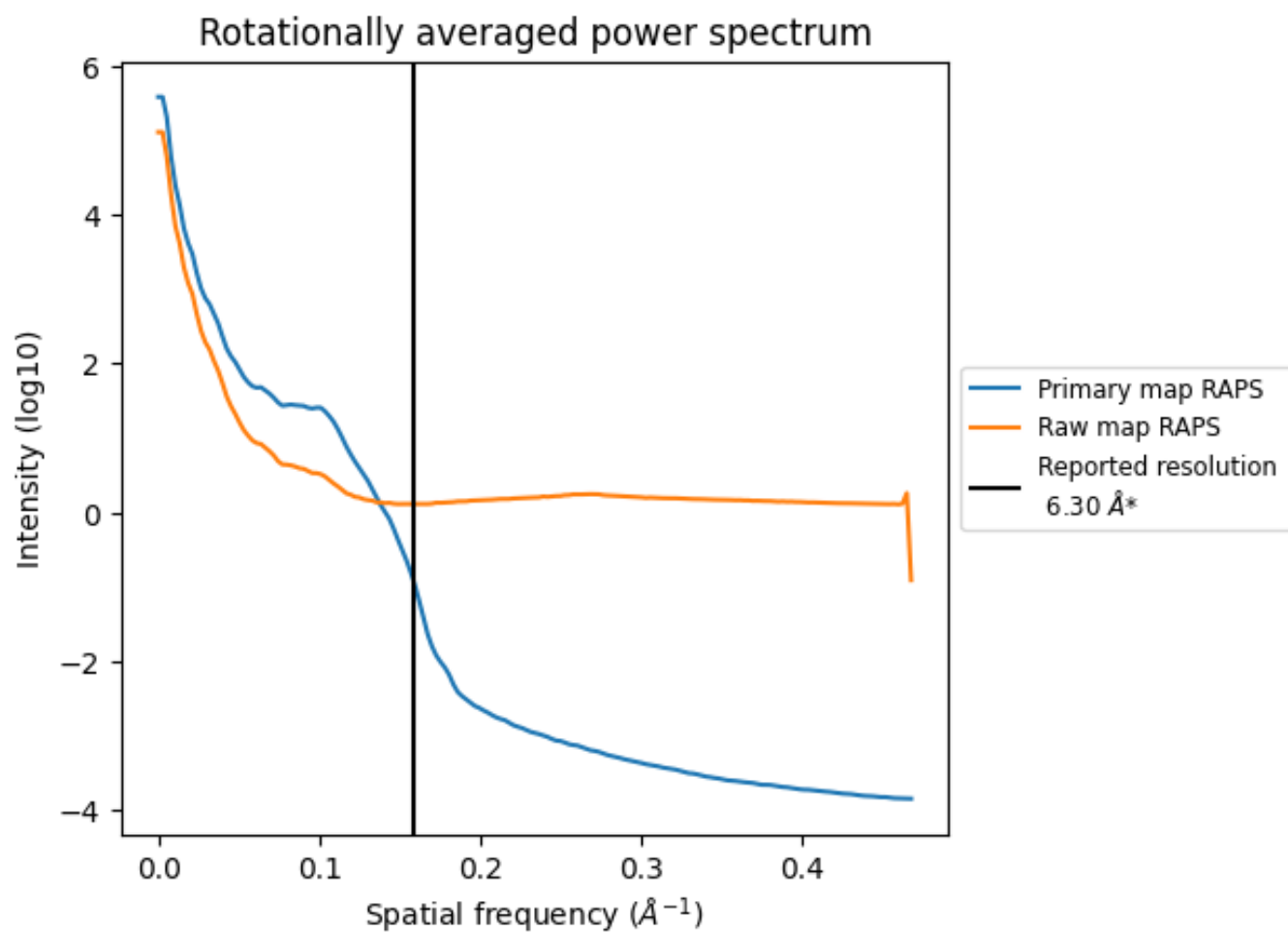
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 413 nm³; this corresponds to an approximate mass of 373 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](#)

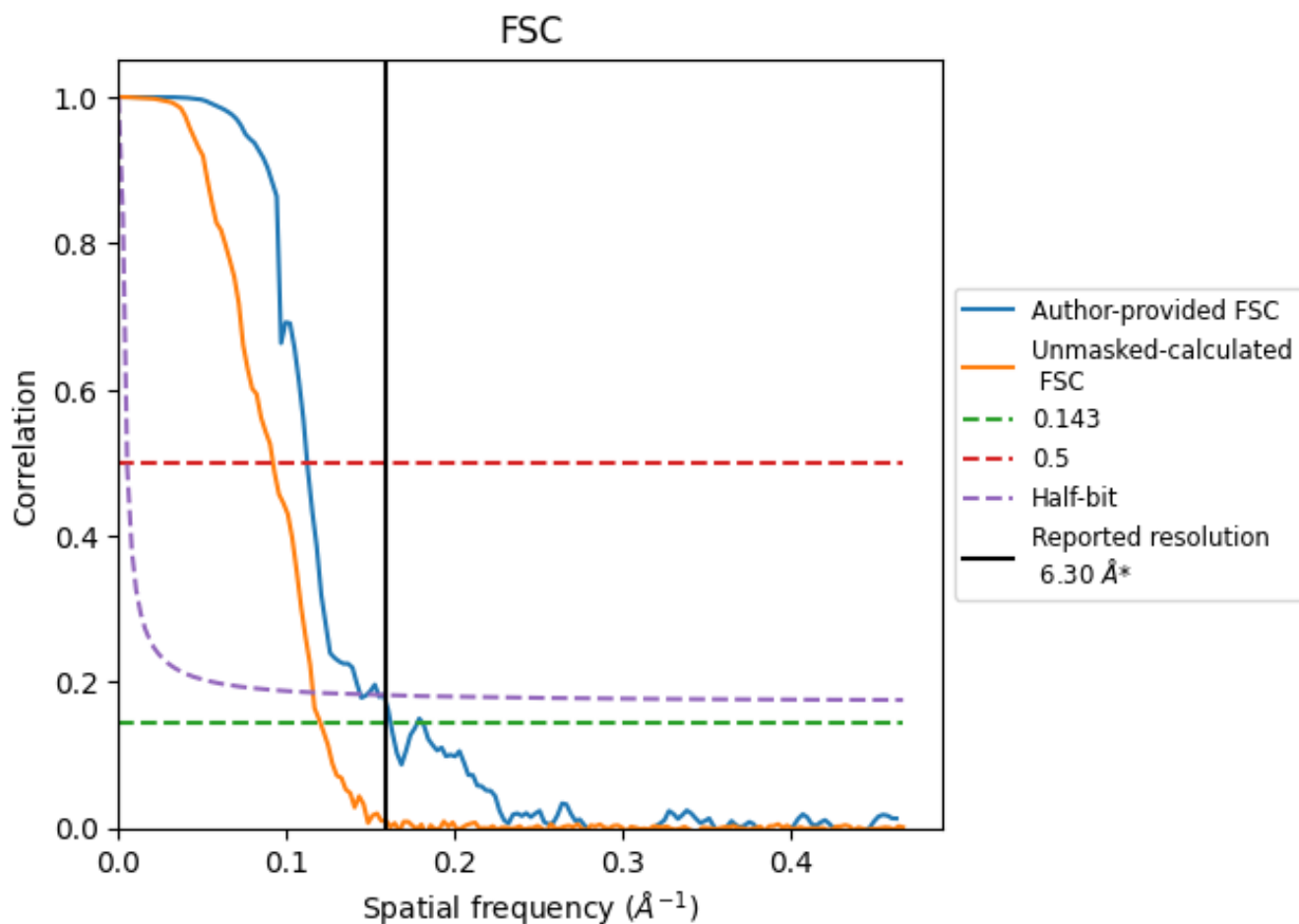


*Reported resolution corresponds to spatial frequency of 0.159 Å⁻¹

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 0.159 Å⁻¹

8.2 Resolution estimates [i](#)

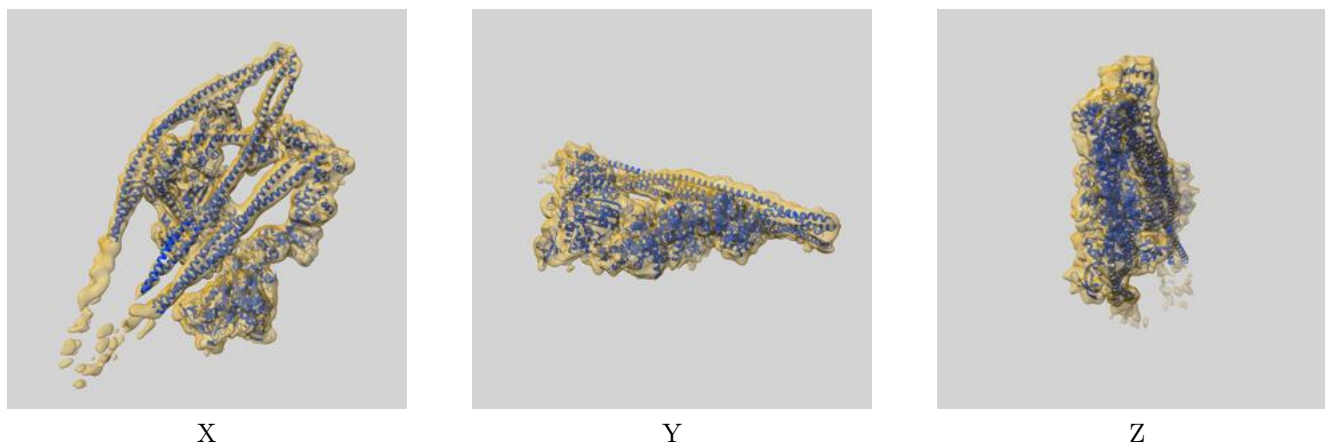
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	6.30	-	-
Author-provided FSC curve	6.17	8.89	6.94
Unmasked-calculated*	8.31	10.87	8.63

*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 8.31 differs from the reported value 6.3 by more than 10 %

9 Map-model fit [i](#)

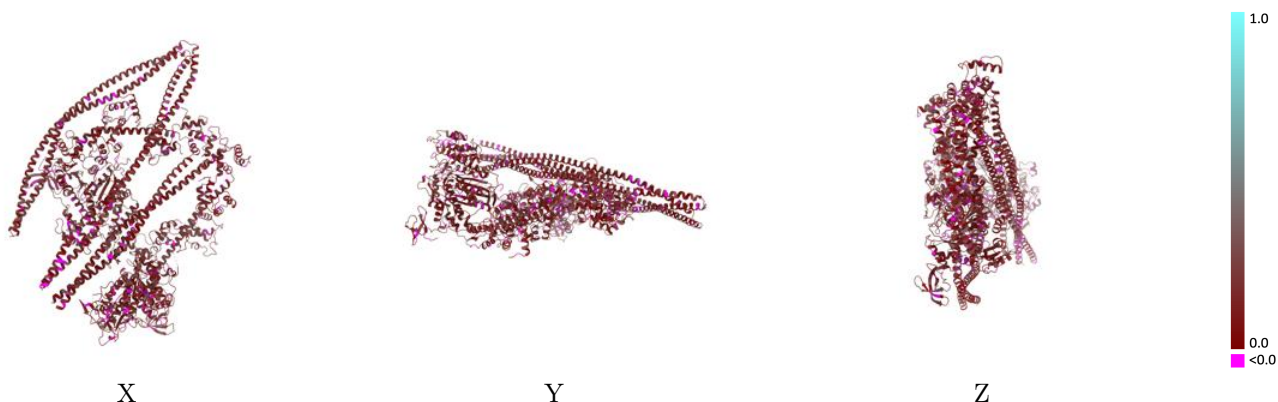
This section contains information regarding the fit between EMDB map EMD-11069 and PDB model 6Z47. Per-residue inclusion information can be found in section 3 on page 11.

9.1 Map-model overlay [i](#)



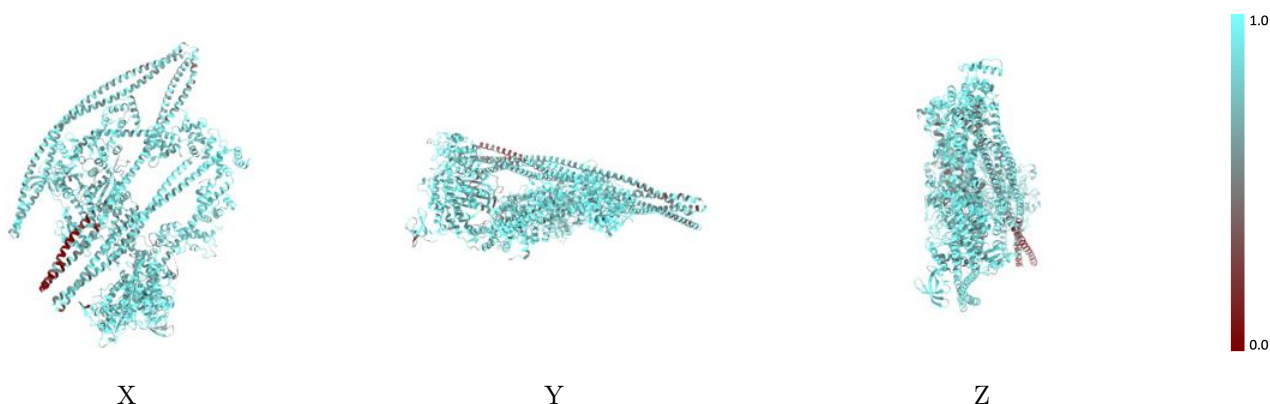
The images above show the 3D surface view of the map at the recommended contour level 0.28 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



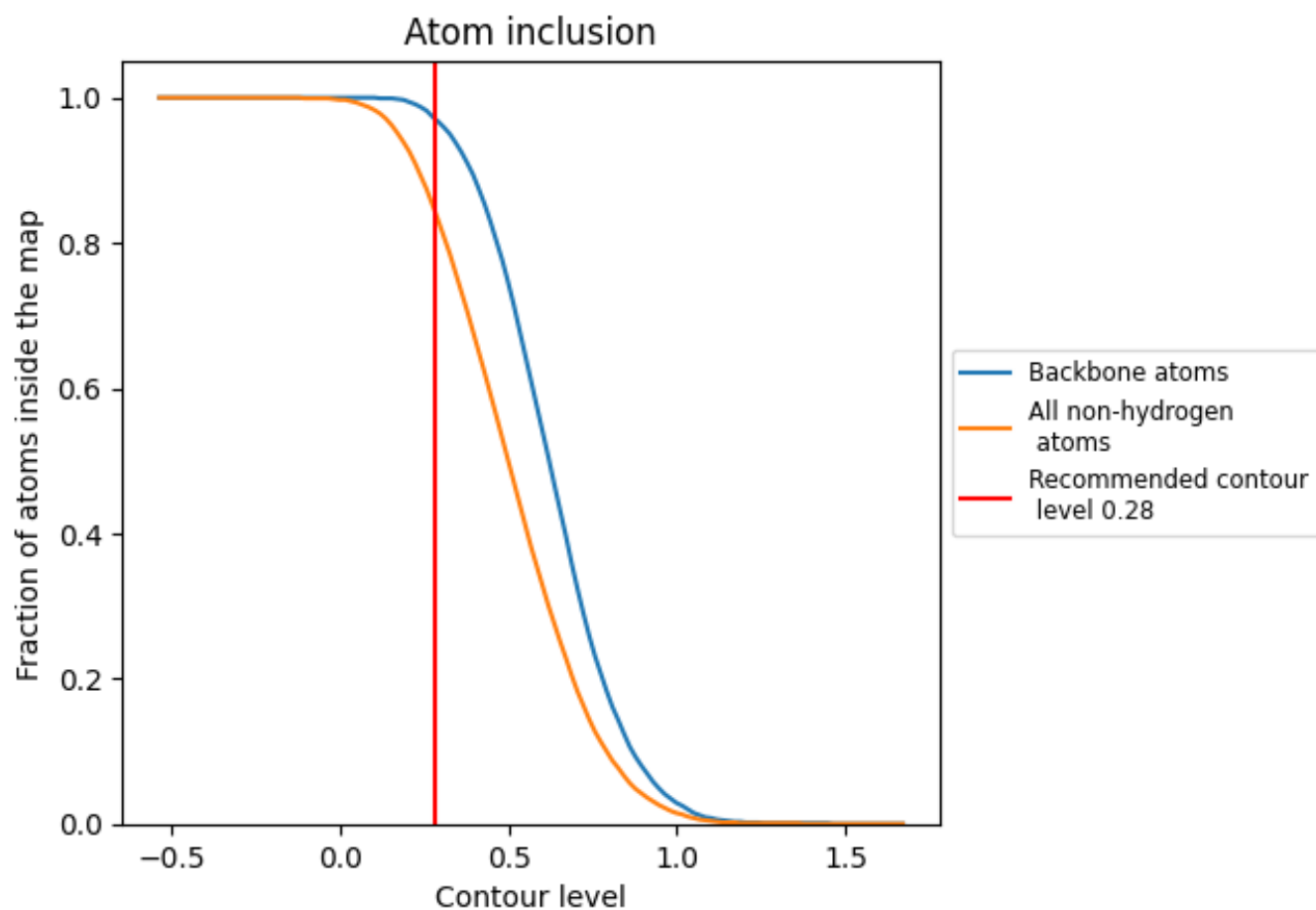
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.28).



















9.4 Atom inclusion [i](#)



At the recommended contour level, 97% of all backbone atoms, 84% 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 (0.28) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.8450	 0.1550
A	 0.8650	 0.1630
B	 0.8640	 0.1520
C	 0.8650	 0.1570
D	 0.8720	 0.1470
E	 0.9140	 0.1570
F	 0.9340	 0.1470
G	 0.7310	 0.1530
H	 0.7060	 0.1440

