



Full wwPDB EM Validation Report ⓘ

Mar 22, 2026 – 11:16 PM UTC

PDB ID : 9BAA / pdb_00009baa
EMDB ID : EMD-44402
Title : Cryo-EM structure of the ABC transporter PCAT1 bound with Mg_class_1
Authors : Zhang, R.; Jagessar, K.L.; Polasa, A.; Brownd, M.; Stein, R.; Moradi, M.;
Karakas, E.; Mchaourab, H.S.
Deposited on : 2024-04-03
Resolution : 3.39 Å(reported)

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

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ 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.dev132
MolProbity : 4-5-2 with Phenix2.0
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.49

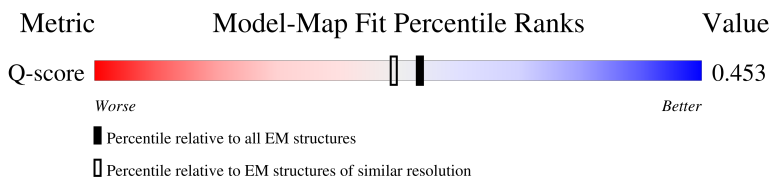
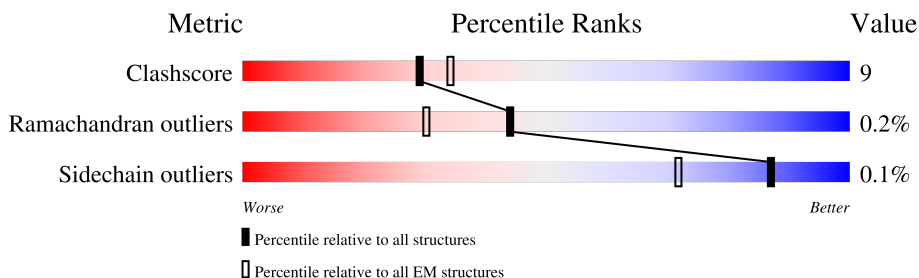
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

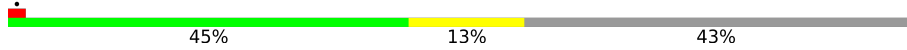
The reported resolution of this entry is 3.39 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	14220 (2.89 - 3.89)

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	750	 45% 13% 43%
1	B	750	 57% 18% 25%

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 7771 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 ABC-type bacteriocin transporter.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	431	Total	C	N	O	S	0	0
			3372	2206	546	602	18		
1	B	563	Total	C	N	O	S	0	0
			4399	2866	718	790	25		

There are 46 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-22	MET	-	initiating methionine	UNP A3DCU1
A	-21	GLY	-	expression tag	UNP A3DCU1
A	-20	HIS	-	expression tag	UNP A3DCU1
A	-19	HIS	-	expression tag	UNP A3DCU1
A	-18	HIS	-	expression tag	UNP A3DCU1
A	-17	HIS	-	expression tag	UNP A3DCU1
A	-16	HIS	-	expression tag	UNP A3DCU1
A	-15	HIS	-	expression tag	UNP A3DCU1
A	-14	HIS	-	expression tag	UNP A3DCU1
A	-13	HIS	-	expression tag	UNP A3DCU1
A	-12	HIS	-	expression tag	UNP A3DCU1
A	-11	HIS	-	expression tag	UNP A3DCU1
A	-10	SER	-	expression tag	UNP A3DCU1
A	-9	SER	-	expression tag	UNP A3DCU1
A	-8	GLY	-	expression tag	UNP A3DCU1
A	-7	HIS	-	expression tag	UNP A3DCU1
A	-6	ILE	-	expression tag	UNP A3DCU1
A	-5	ASP	-	expression tag	UNP A3DCU1
A	-4	ASP	-	expression tag	UNP A3DCU1
A	-3	ASP	-	expression tag	UNP A3DCU1
A	-2	ASP	-	expression tag	UNP A3DCU1
A	-1	LYS	-	expression tag	UNP A3DCU1
A	0	HIS	-	expression tag	UNP A3DCU1
B	-22	MET	-	initiating methionine	UNP A3DCU1
B	-21	GLY	-	expression tag	UNP A3DCU1
B	-20	HIS	-	expression tag	UNP A3DCU1

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-19	HIS	-	expression tag	UNP A3DCU1
B	-18	HIS	-	expression tag	UNP A3DCU1
B	-17	HIS	-	expression tag	UNP A3DCU1
B	-16	HIS	-	expression tag	UNP A3DCU1
B	-15	HIS	-	expression tag	UNP A3DCU1
B	-14	HIS	-	expression tag	UNP A3DCU1
B	-13	HIS	-	expression tag	UNP A3DCU1
B	-12	HIS	-	expression tag	UNP A3DCU1
B	-11	HIS	-	expression tag	UNP A3DCU1
B	-10	SER	-	expression tag	UNP A3DCU1
B	-9	SER	-	expression tag	UNP A3DCU1
B	-8	GLY	-	expression tag	UNP A3DCU1
B	-7	HIS	-	expression tag	UNP A3DCU1
B	-6	ILE	-	expression tag	UNP A3DCU1
B	-5	ASP	-	expression tag	UNP A3DCU1
B	-4	ASP	-	expression tag	UNP A3DCU1
B	-3	ASP	-	expression tag	UNP A3DCU1
B	-2	ASP	-	expression tag	UNP A3DCU1
B	-1	LYS	-	expression tag	UNP A3DCU1
B	0	HIS	-	expression tag	UNP A3DCU1

ASP	ASP	L555	R472	I314	T180	VAL
SER	SER	E556	E473	Y319	K191	LYS
ILE	ILE	R559	R560	V323	F192	ALA
THR	THR	K561	ASP	F326	L193	SER
GLU	GLU	I562	ASP	N327	I198	LYS
ASN	ASN	A563	PHE	F200	K199	GLU
HIS	HIS	T575	VAL	K328	E201	ASP
ILE	ILE	V567	ILE	P329	K202	LEU
LYS	LYS	I592	SER	I337	F217	LYS
GLY	GLY	A596	LEU	K353	I221	ASP
LEU	LEU	N600	GLY	I358	N224	P86
GLU	GLU	A601	ASP	A363	Y225	L85
ASP	ASP	F604	ARG	S382	Y226	P86
VAL	VAL	I605	ASN	G386	I229	N90
ILE	ILE	E606	VAL	M387	L230	V91
ILE	ILE	P609	D492	L388	M236	I92
ALA	ALA	L610	R494	Y389	M243	V93
HIS	HIS	K611	L497	I390	M244	D94
ARG	ARG	R499	R499	I398	K252	N95
LEU	LEU	P500	P500	L408	N256	R96
SER	SER	THR	VAL	G411	F257	L87
THR	THR	PHE	LEU	A412	M270	A98
ILE	ILE	LEU	LYS	I416	D272	H99
VAL	VAL	ASN	ASN	M420	I276	V102
CYS	CYS	GLU	ILE	L425	A279	I103
ASP	ASP	GLY	PRO	L426	A283	Y104
LYS	LYS	GLN	LYS	A427	T284	S105
GLY	GLY	K628	THR	F428	M288	I106
GLU	GLU	Q629	VAL	L431	I289	LYS
ILE	ILE	R630	ALA	T451	G297	ASN
VAL	VAL	I633	ILE	A452	L299	ARG
GLU	GLU	I633	VAL	S456	L301	ILE
SER	SER	K639	GLY	R457	L302	ILE
SER	SER	I643	SER	R458	Q304	THR
HIS	HIS	D647	GLY	L459	N305	VAL
THR	THR	GLU	S523	G460	L308	VAL
LEU	LEU	ILE	L531	T467		L136
ALA	ALA	ALA	S537			I131
LEU	LEU	THR	P538			W132
LYS	LYS	SER	I553			T133
GLY	GLY	LEU	S554			L136
ASN	ASN					L139
LEU	LEU					E140
						M154
						K163
						Y179

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	148874	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	1.14708	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.784	Depositor
Minimum map value	-1.255	Depositor
Average map value	0.002	Depositor
Map value standard deviation	0.042	Depositor
Recommended contour level	0.15	Depositor
Map size ($\text{\AA}$)	232.92, 232.92, 232.92	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	0.647, 0.647, 0.647	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	A	0.17	0/3421	0.35	0/4601
1	B	0.16	0/4468	0.35	0/6014
All	All	0.17	0/7889	0.35	0/10615

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	3372	0	3580	72	0
1	B	4399	0	4600	93	0
All	All	7771	0	8180	149	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 9.

All (149) 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:B:596:ALA:HB1	1:B:600:ASN:HD22	1.50	0.74
1:B:31:GLN:HE22	1:B:36:LYS:HG3	1.57	0.69

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:597:LYS:HG3	1:A:598:MET:HG3	1.75	0.68
1:A:171:CYS:HG	1:A:226:TYR:HH	1.36	0.68
1:B:29:ILE:HD11	1:B:102:VAL:HG21	1.76	0.67
1:A:420:MET:HG2	1:A:421:SER:H	1.61	0.66
1:A:598:MET:HE1	1:A:635:ARG:HE	1.62	0.64
1:B:305:ASN:ND2	1:B:420:MET:SD	2.71	0.64
1:A:359:LYS:HB3	1:B:559:ARG:HH21	1.63	0.63
1:B:494:ARG:HH22	1:B:497:LEU:HD23	1.63	0.63
1:B:472:ARG:NH2	1:B:553:ILE:O	2.33	0.62
1:A:229:ILE:HG12	1:B:387:MET:HE1	1.83	0.61
1:B:95:ASN:HB2	1:B:99:HIS:CD2	2.38	0.59
1:A:288:MET:HG2	1:A:289:ILE:HG23	1.83	0.59
1:B:284:THR:O	1:B:288:MET:HG3	2.02	0.58
1:A:598:MET:HB2	1:A:630:ARG:HH22	1.69	0.58
1:B:563:ALA:HB2	1:B:639:LYS:HD3	1.85	0.58
1:B:297:GLY:O	1:B:301:LEU:HG	2.04	0.57
1:A:412:ALA:HB2	1:B:193:LEU:HD21	1.86	0.57
1:A:244:MET:HE2	1:A:244:MET:HA	1.87	0.57
1:B:191:LYS:HB2	1:B:427:ALA:HB2	1.85	0.56
1:B:604:PHE:O	1:B:606:GLU:N	2.37	0.56
1:B:494:ARG:HH11	1:B:500:PRO:HD3	1.71	0.56
1:A:279:ALA:HB2	1:A:452:ALA:HB1	1.88	0.56
1:A:626:GLY:O	1:A:629:GLN:NE2	2.39	0.56
1:B:556:GLU:O	1:B:560:LYS:HG2	2.06	0.56
1:B:279:ALA:HB2	1:B:452:ALA:CB	2.36	0.55
1:B:499:LYS:O	1:B:500:PRO:C	2.47	0.55
1:B:301:LEU:HD21	1:B:431:LEU:HB3	1.89	0.55
1:B:327:ASN:OD1	1:B:328:LYS:N	2.40	0.55
1:A:426:LEU:HD21	1:B:426:LEU:HD21	1.89	0.55
1:A:398:ILE:HG13	1:B:221:ILE:HG21	1.89	0.55
1:B:601:ALA:HA	1:B:630:ARG:HD2	1.88	0.54
1:B:575:THR:OG1	1:B:609:PRO:HB2	2.08	0.54
1:B:279:ALA:O	1:B:283:ALA:HB3	2.07	0.54
1:A:545:ILE:HG13	1:A:546:ASN:H	1.73	0.53
1:B:283:ALA:HA	1:B:445:LEU:HD21	1.91	0.53
1:B:386:GLY:O	1:B:390:ILE:HG12	2.09	0.53
1:A:594:LYS:HZ1	1:A:597:LYS:HD3	1.75	0.51
1:B:200:PHE:O	1:B:202:LYS:HG2	2.11	0.51
1:A:571:ILE:HG21	1:A:610:LEU:HD22	1.93	0.51
1:A:416:ILE:HD11	1:B:198:ILE:HD13	1.93	0.51
1:B:560:LYS:HA	1:B:639:LYS:HZ1	1.76	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:412:ALA:O	1:A:416:ILE:HG12	2.11	0.51
1:A:387:MET:HE1	1:B:229:ILE:HD12	1.93	0.51
1:B:411:GLY:HA3	1:B:425:LEU:HD13	1.92	0.51
1:B:328:LYS:CG	1:B:329:PRO:HD3	2.40	0.50
1:B:328:LYS:HG3	1:B:329:PRO:HD3	1.94	0.49
1:A:580:LEU:HB3	1:B:363:ALA:HB3	1.94	0.49
1:B:69:ALA:HA	1:B:140:GLU:HG2	1.94	0.49
1:B:326:PHE:C	1:B:329:PRO:HD2	2.38	0.49
1:B:299:ILE:O	1:B:303:ILE:HG12	2.12	0.49
1:B:154:MET:SD	1:B:460:GLY:HA3	2.53	0.49
1:A:589:MET:HE3	1:A:638:LEU:HD22	1.95	0.48
1:A:246:TYR:HE1	1:A:462:ILE:HG21	1.79	0.48
1:A:543:ILE:HG13	1:A:544:LEU:H	1.77	0.48
1:B:252:LYS:O	1:B:467:THR:OG1	2.23	0.48
1:A:290:ASP:OD2	1:A:442:LEU:HD13	2.14	0.48
1:B:575:THR:HA	1:B:611:LYS:HB2	1.96	0.48
1:B:256:ASN:OD1	1:B:257:PHE:N	2.47	0.47
1:A:630:ARG:HD2	1:A:630:ARG:O	2.14	0.47
1:A:191:LYS:O	1:A:195:ASP:HB2	2.13	0.47
1:A:559:ARG:O	1:A:639:LYS:NZ	2.40	0.47
1:A:221:ILE:HG21	1:B:398:ILE:HG13	1.96	0.47
1:A:600:ASN:HB3	1:A:635:ARG:NH2	2.30	0.47
1:B:180:THR:OG1	1:B:293:MET:SD	2.58	0.47
1:B:16:TYR:HB3	1:B:458:ARG:HG2	1.97	0.47
1:B:279:ALA:HB2	1:B:452:ALA:HB1	1.97	0.47
1:A:458:ARG:O	1:A:461:GLU:HG3	2.15	0.46
1:A:198:ILE:HD11	1:B:412:ALA:HA	1.97	0.46
1:B:448:LEU:O	1:B:451:THR:HG22	2.16	0.46
1:B:555:LEU:HD11	1:B:559:ARG:NH1	2.30	0.46
1:A:561:LYS:HE3	1:A:642:ASP:HB2	1.98	0.46
1:B:272:ASP:OD2	1:B:458:ARG:NH1	2.49	0.46
1:A:592:ILE:HB	1:A:595:ALA:HB2	1.97	0.45
1:A:284:THR:O	1:A:288:MET:N	2.46	0.45
1:A:267:ILE:O	1:A:270:PHE:HB2	2.17	0.45
1:A:455:ALA:O	1:A:459:LEU:HD23	2.16	0.45
1:A:526:THR:O	1:A:530:LYS:HG2	2.17	0.45
1:B:29:ILE:HG21	1:B:139:LEU:HD21	1.98	0.45
1:B:308:LEU:HB3	1:B:428:PHE:CZ	2.52	0.45
1:B:91:VAL:HG13	1:B:131:ILE:HB	1.99	0.45
1:A:201:GLU:HA	1:B:416:ILE:HD12	1.98	0.44
1:A:289:ILE:O	1:A:293:MET:HB3	2.16	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:308:LEU:HD22	1:A:407:ILE:HG23	1.99	0.44
1:B:27:SER:O	1:B:31:GLN:HG2	2.16	0.44
1:B:388:LEU:HD23	1:B:388:LEU:HA	1.82	0.44
1:A:589:MET:HE2	1:A:589:MET:HB3	1.93	0.44
1:B:531:LEU:HD21	1:B:538:PRO:HB3	1.99	0.44
1:A:375:ILE:HA	1:A:378:VAL:HG12	1.98	0.44
1:A:632:ALA:O	1:A:636:ALA:CB	2.66	0.44
1:B:15:GLN:HB2	1:B:20:ASP:OD2	2.18	0.44
1:B:353:LYS:O	1:B:353:LYS:HD2	2.17	0.44
1:A:401:GLY:HA3	1:B:217:PHE:CZ	2.53	0.43
1:B:12:CYS:SG	1:B:13:VAL:N	2.91	0.43
1:B:587:VAL:HB	1:B:592:ILE:HD11	2.00	0.43
1:A:562:ILE:HD12	1:A:643:ILE:HG22	1.99	0.43
1:A:550:ILE:HG13	1:A:558:ILE:HD11	2.00	0.43
1:B:289:ILE:O	1:B:293:MET:HG2	2.19	0.43
1:A:593:ILE:O	1:A:597:LYS:NZ	2.51	0.43
1:B:562:ILE:HD13	1:B:643:ILE:HB	2.01	0.43
1:A:426:LEU:CD2	1:B:426:LEU:HD21	2.48	0.43
1:B:499:LYS:HB3	1:B:499:LYS:HE3	1.23	0.43
1:B:226:TYR:CZ	1:B:230:LEU:HD11	2.54	0.43
1:B:12:CYS:HB2	1:B:114:ALA:HB1	1.99	0.43
1:B:37:MET:HE1	1:B:65:LEU:HG	2.00	0.43
1:A:582:LEU:HD23	1:A:583:GLY:N	2.34	0.42
1:A:587:VAL:HG13	1:A:590:ASP:HA	1.99	0.42
1:B:408:LEU:HD23	1:B:408:LEU:HA	1.90	0.42
1:A:162:LEU:HD11	1:A:280:ILE:HG23	2.02	0.42
1:A:411:GLY:O	1:A:415:VAL:HG23	2.19	0.42
1:B:244:MET:HA	1:B:244:MET:HE2	2.01	0.42
1:A:420:MET:HG2	1:A:421:SER:N	2.31	0.42
1:B:42:ILE:O	1:B:46:THR:HG22	2.19	0.42
1:B:276:ILE:HD11	1:B:456:SER:N	2.35	0.42
1:B:472:ARG:HE	1:B:555:LEU:HB2	1.85	0.42
1:A:570:PHE:HZ	1:B:358:ILE:HD11	1.84	0.42
1:B:629:GLN:O	1:B:633:ILE:HG13	2.19	0.42
1:A:444:ASP:O	1:A:447:PRO:HD2	2.19	0.42
1:A:594:LYS:NZ	1:A:597:LYS:HD3	2.34	0.42
1:B:70:LYS:NZ	1:B:140:GLU:OE2	2.53	0.42
1:B:319:TYR:CZ	1:B:323:VAL:HG21	2.54	0.42
1:A:180:THR:HG21	1:A:293:MET:HG2	2.01	0.42
1:A:191:LYS:HB2	1:A:427:ALA:HB2	2.01	0.42
1:B:31:GLN:NE2	1:B:36:LYS:HG3	2.29	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:223:LEU:HD23	1:A:223:LEU:HA	1.88	0.42
1:A:415:VAL:HG22	1:A:421:SER:O	2.20	0.41
1:A:289:ILE:O	1:A:438:PRO:HB3	2.20	0.41
1:A:218:LEU:HD23	1:A:218:LEU:HA	1.91	0.41
1:A:343:LYS:HB3	1:A:343:LYS:HE2	1.89	0.41
1:A:416:ILE:HG23	1:B:201:GLU:HG3	2.01	0.41
1:A:421:SER:OG	1:A:424:GLN:OE1	2.24	0.41
1:B:243:MET:HE2	1:B:270:PHE:HE2	1.86	0.41
1:B:90:ASN:HD22	1:B:136:LEU:HD12	1.85	0.41
1:B:337:ILE:HD11	1:B:382:SER:HA	2.03	0.41
1:A:574:GLY:HA2	1:A:609:PRO:HA	2.03	0.41
1:A:293:MET:HE1	1:A:438:PRO:HG3	2.03	0.41
1:A:553:ILE:HG23	1:A:554:SER:H	1.85	0.41
1:B:85:LEU:HB3	1:B:86:PRO:HD3	2.03	0.41
1:B:179:TYR:CE2	1:B:224:ASN:HB2	2.55	0.41
1:B:314:ILE:HD13	1:B:314:ILE:HA	1.90	0.41
1:A:531:LEU:HD11	1:A:538:PRO:HA	2.02	0.41
1:B:179:TYR:HE2	1:B:224:ASN:HB2	1.87	0.41
1:A:383:PHE:HB2	1:B:236:MET:SD	2.61	0.40
1:A:281:SER:O	1:A:284:THR:OG1	2.23	0.40
1:B:115:ASP:OD2	1:B:117:GLY:N	2.54	0.40
1:B:537:SER:HA	1:B:538:PRO:HD3	1.93	0.40
1:B:163:LYS:HB3	1:B:163:LYS:HE3	1.76	0.40
1:B:225:TYR:O	1:B:229:ILE:HG12	2.22	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	425/750 (57%)	392 (92%)	33 (8%)	0	100 100

Continued on next page...

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	551/750 (74%)	503 (91%)	46 (8%)	2 (0%)	30	59
All	All	976/1500 (65%)	895 (92%)	79 (8%)	2 (0%)	44	71

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	127	ASP
1	B	499	LYS

5.3.2 Protein sidechains ⓘ

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	371/644 (58%)	371 (100%)	0	100	100
1	B	478/644 (74%)	477 (100%)	1 (0%)	87	85
All	All	849/1288 (66%)	848 (100%)	1 (0%)	87	89

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	499	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	224	ASN
1	A	305	ASN
1	A	327	ASN
1	A	414	ASN
1	A	429	ASN
1	A	450	GLN
1	B	31	GLN
1	B	304	GLN

Continued on next page...

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Mol	Chain	Res	Type
1	B	567	GLN
1	B	579	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

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](#)

There are no chain breaks in this entry.

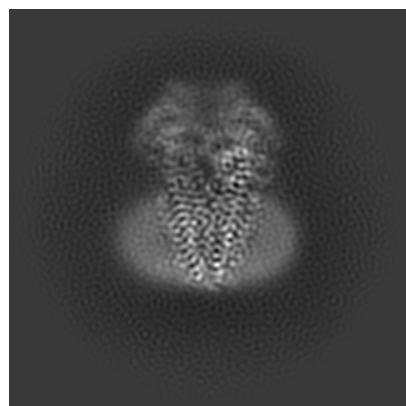
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-44402. These allow visual inspection of the internal detail of the map and identification of artifacts.

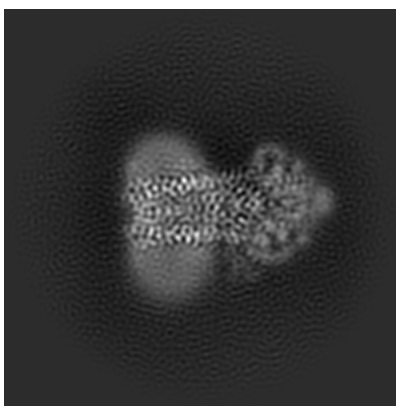
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

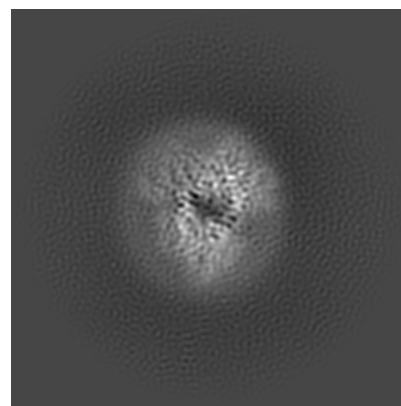
6.1.1 Primary map



X

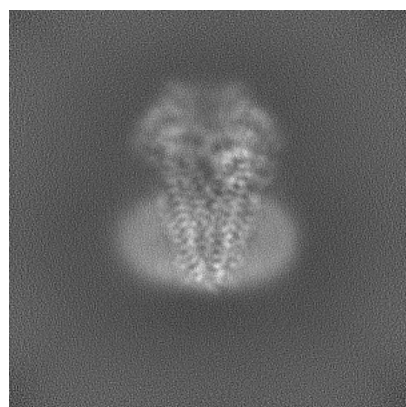


Y

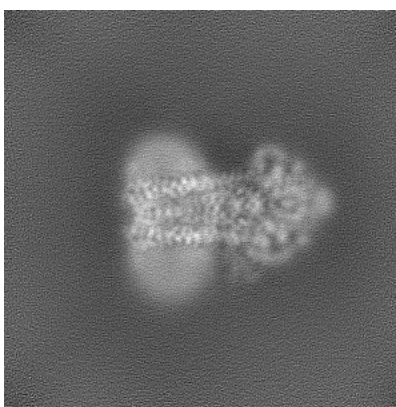


Z

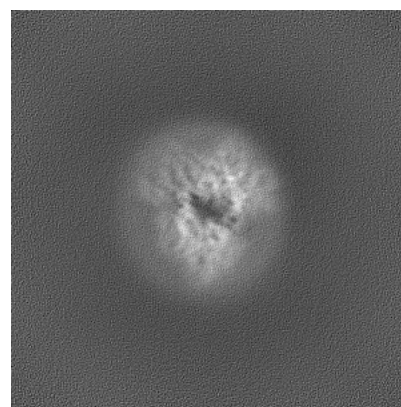
6.1.2 Raw map



X



Y



Z

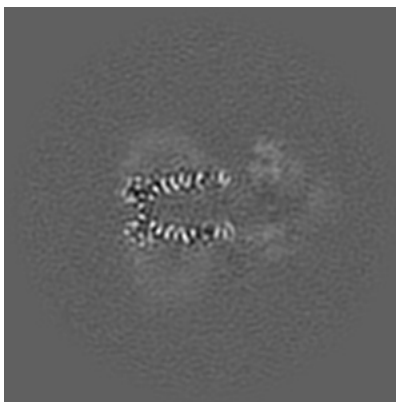
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

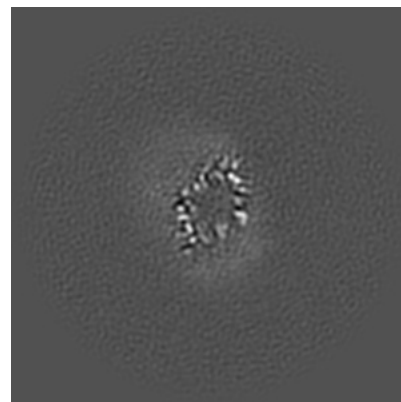
6.2.1 Primary map



X Index: 180

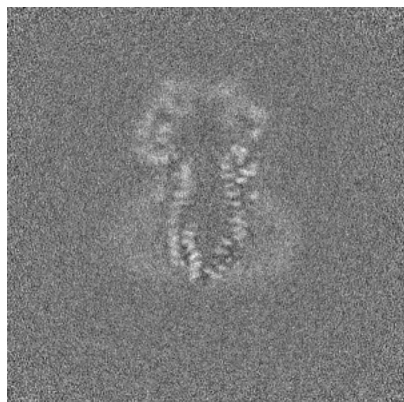


Y Index: 180

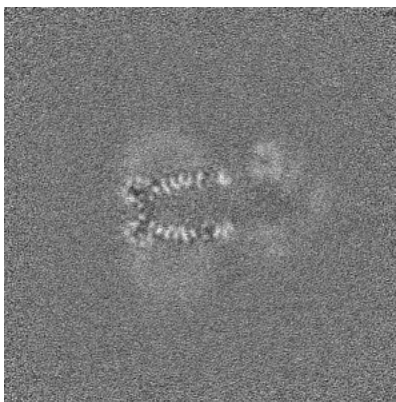


Z Index: 180

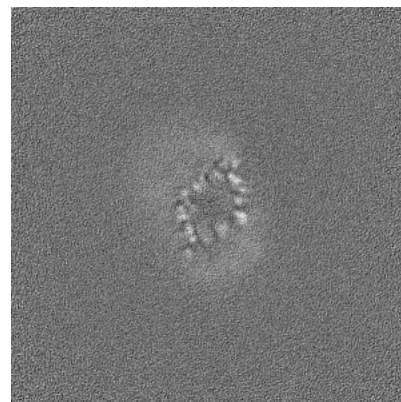
6.2.2 Raw map



X Index: 180



Y Index: 180

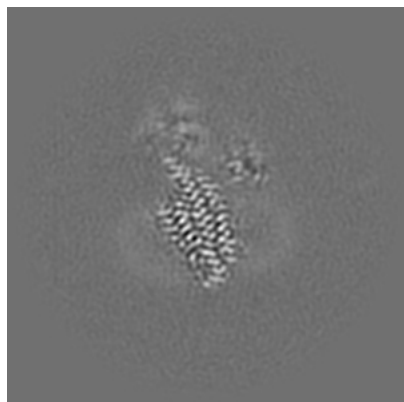


Z Index: 180

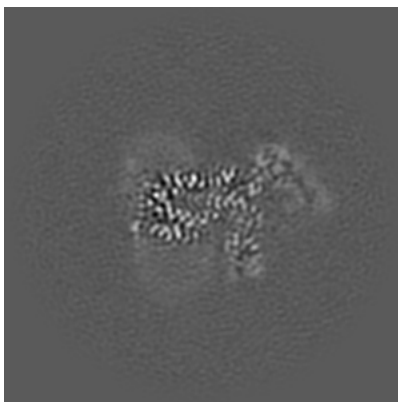
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

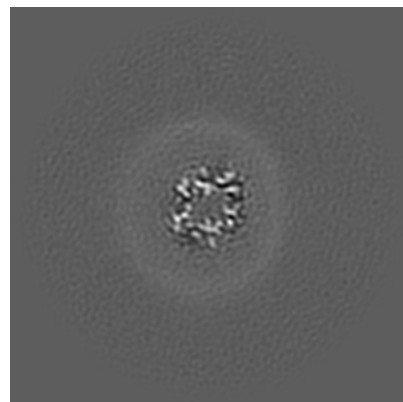
6.3.1 Primary map



X Index: 157

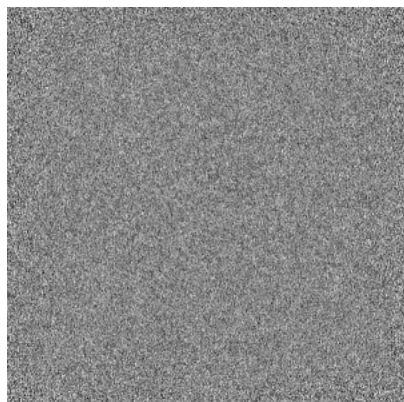


Y Index: 198

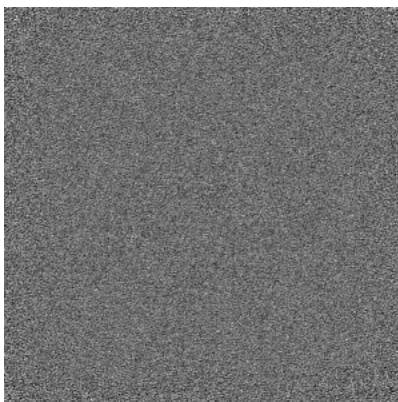


Z Index: 149

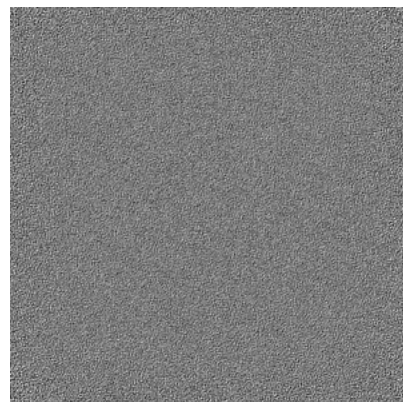
6.3.2 Raw map



X Index: 0



Y Index: 0

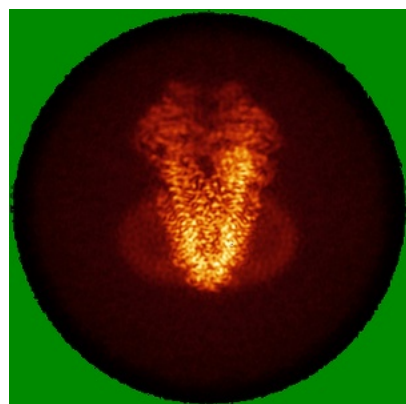


Z Index: 0

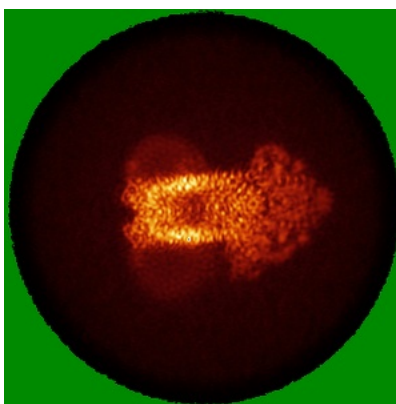
The images above show the largest variance slices of the map in three orthogonal directions.

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

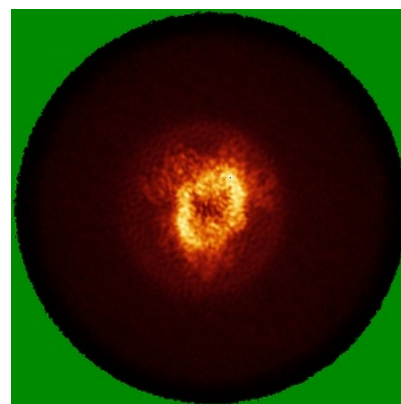
6.4.1 Primary map



X



Y

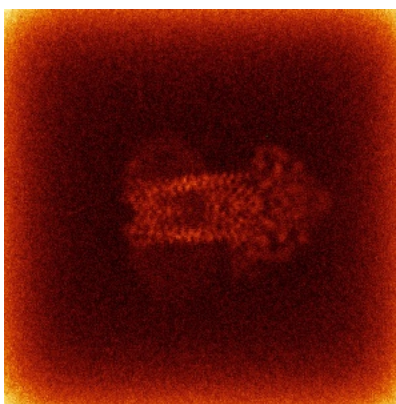


Z

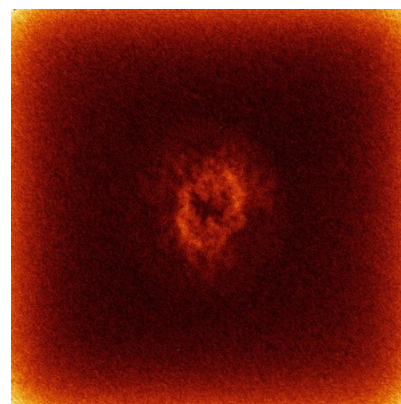
6.4.2 Raw map



X



Y

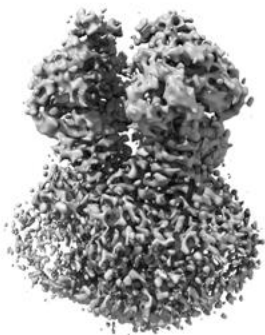


Z

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](#)

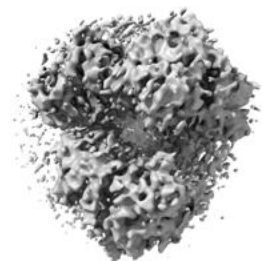
6.5.1 Primary map



X



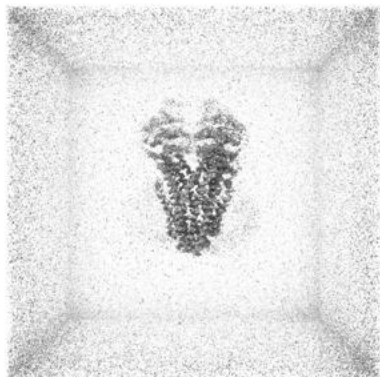
Y



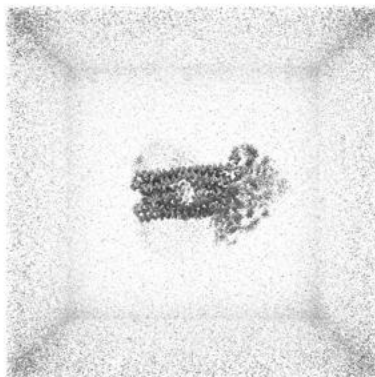
Z

The images above show the 3D surface view of the map at the recommended contour level 0.15. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

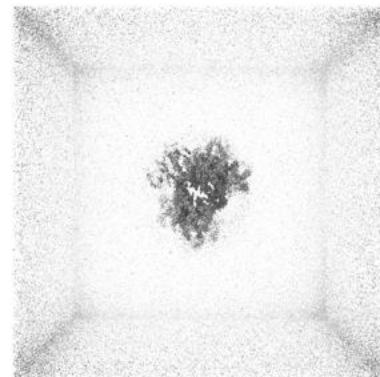
6.5.2 Raw map



X



Y



Z

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

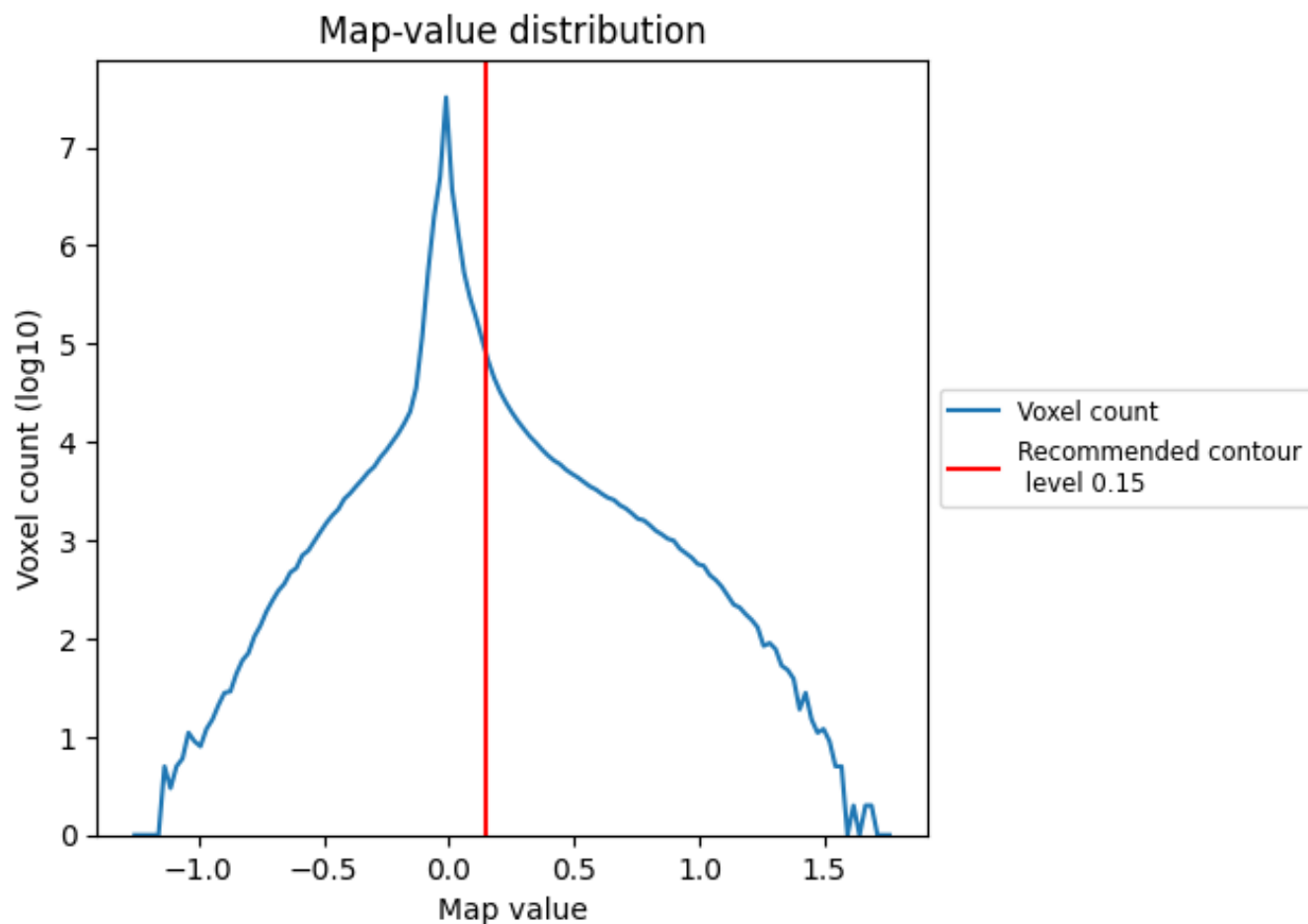
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

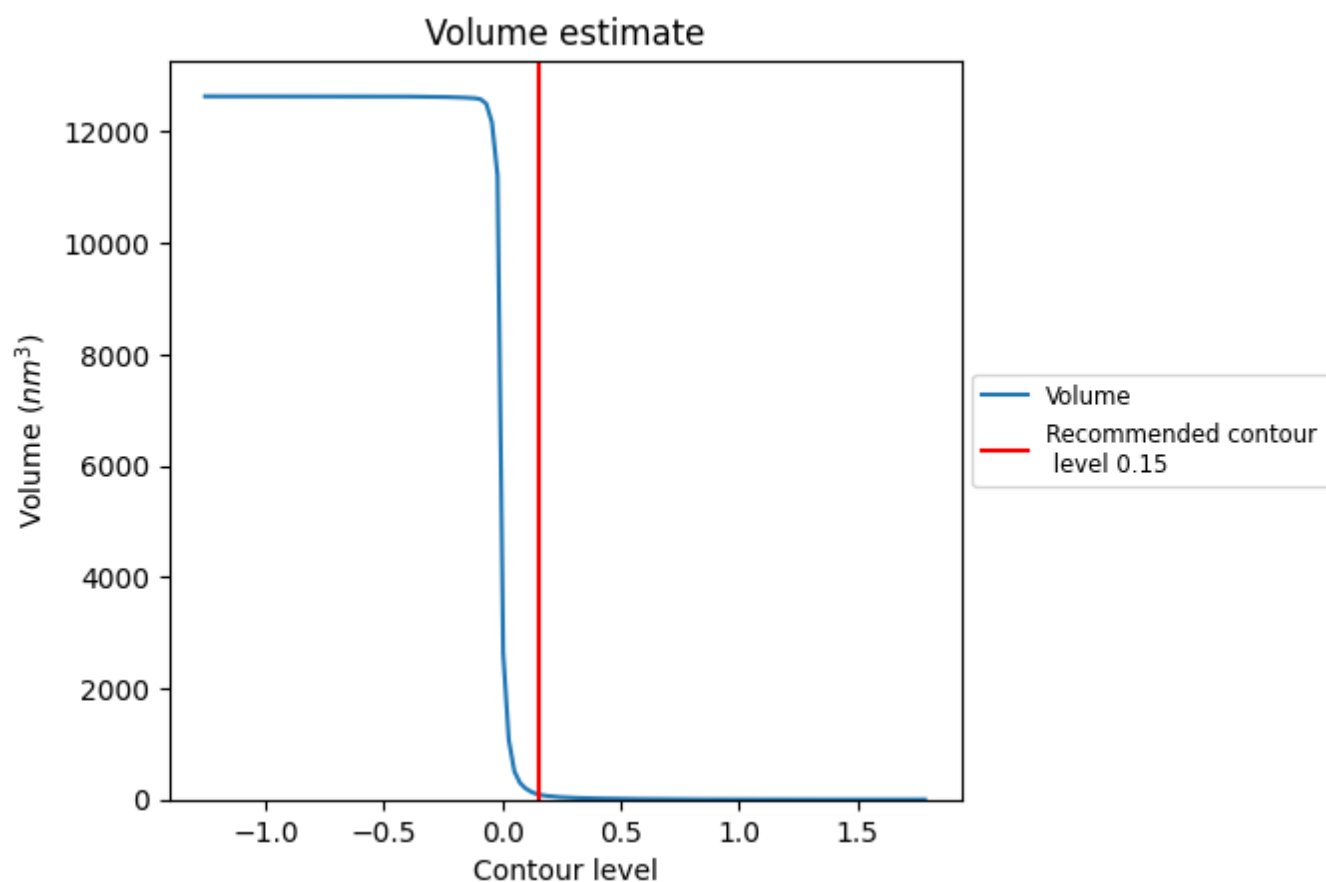
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

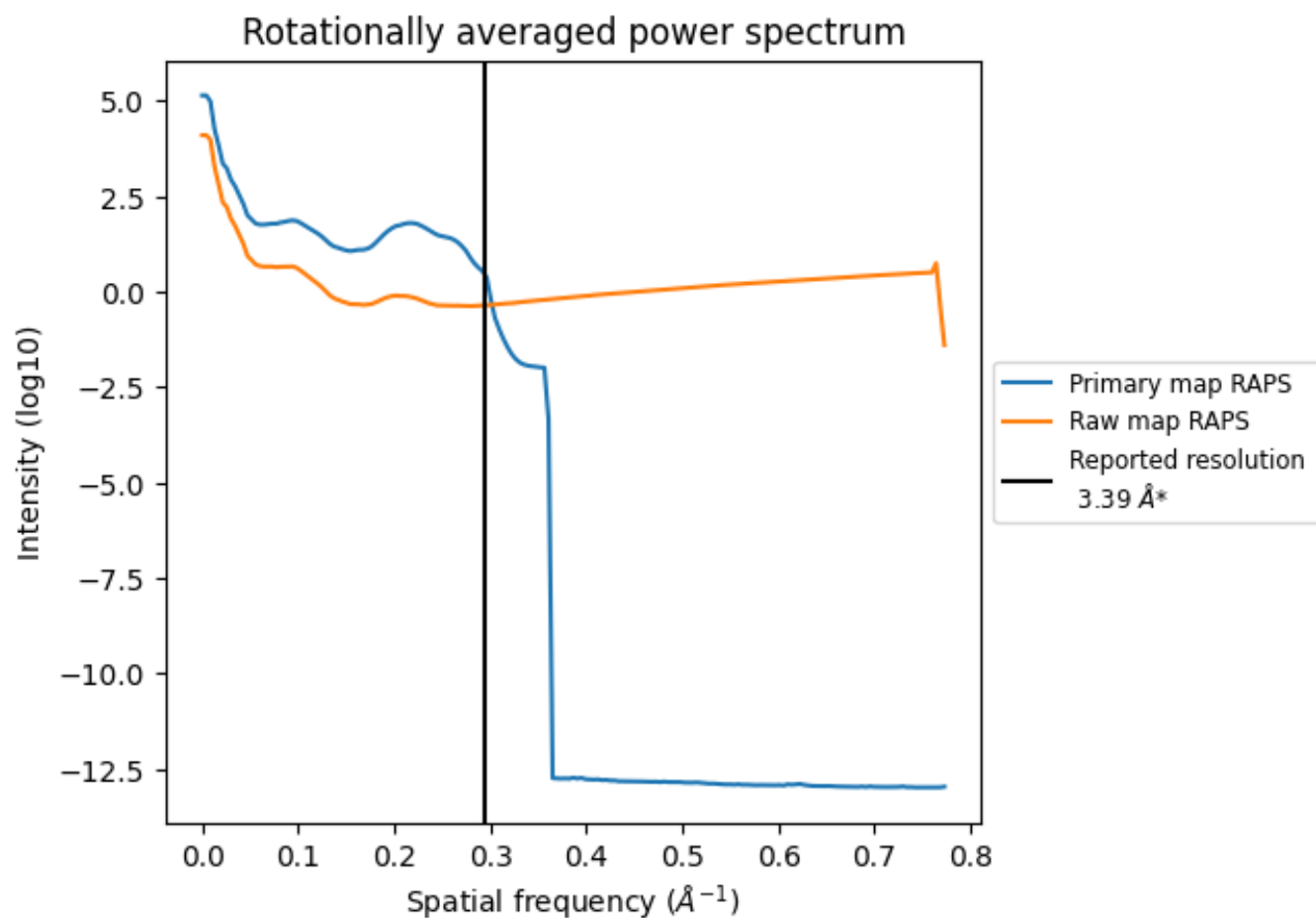
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 96 nm^3 ; this corresponds to an approximate mass of 87 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum ⓘ

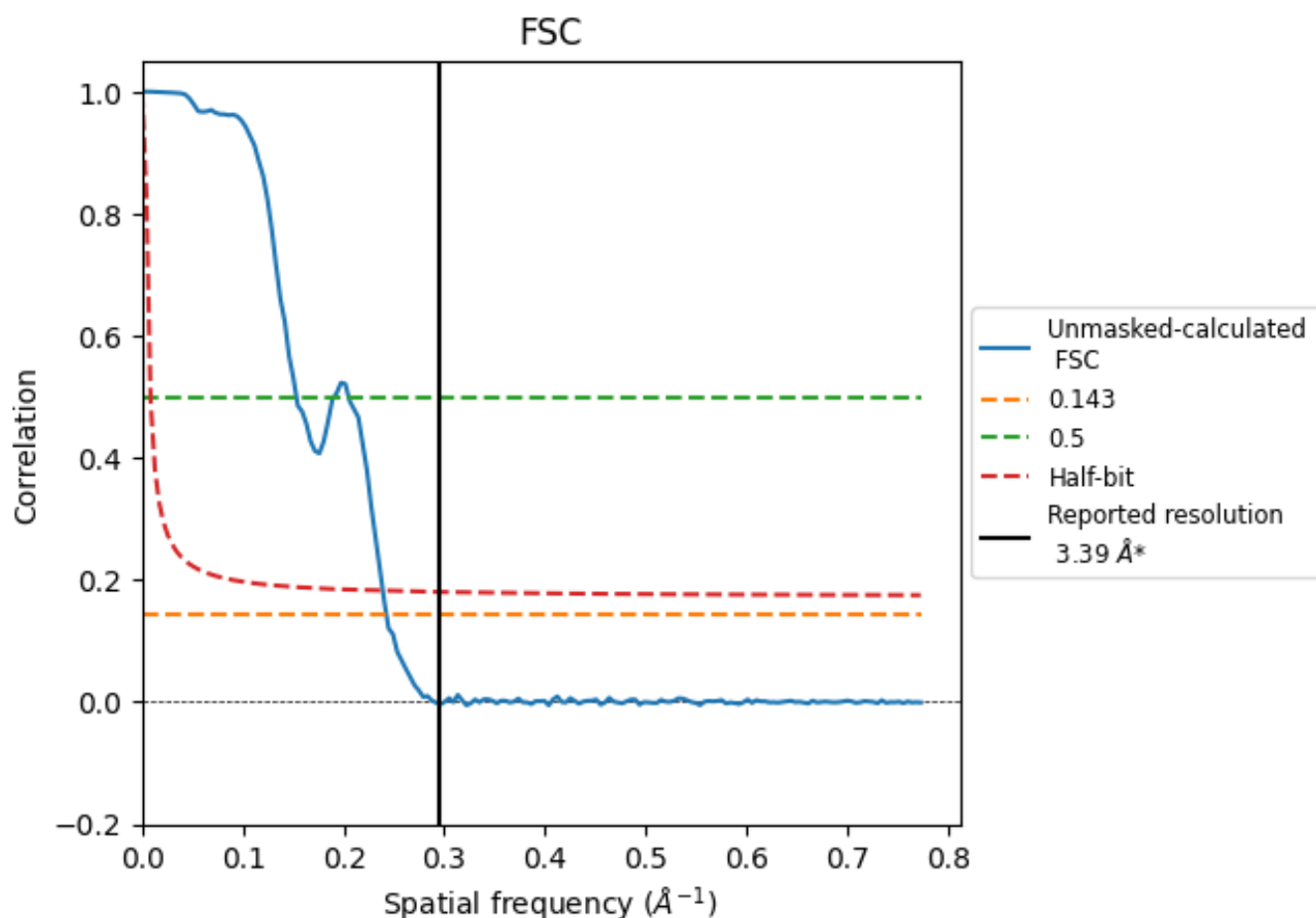


*Reported resolution corresponds to spatial frequency of 0.295 Å⁻¹

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 0.295 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

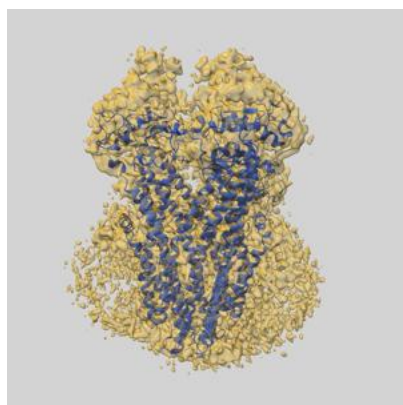
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.39	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	4.12	6.53	4.18

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.12 differs from the reported value 3.39 by more than 10 %

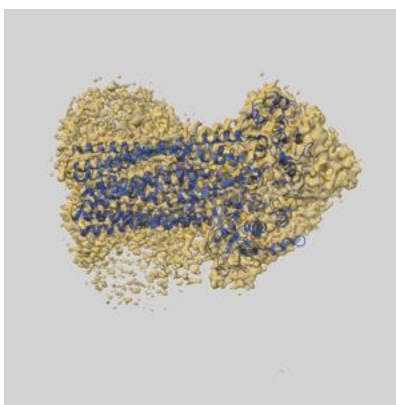
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-44402 and PDB model 9BAA. Per-residue inclusion information can be found in section [3](#) on page [5](#).

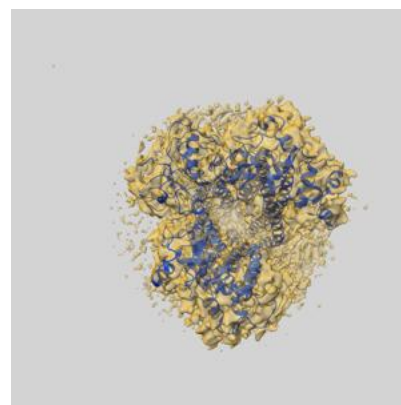
9.1 Map-model overlay [i](#)



X



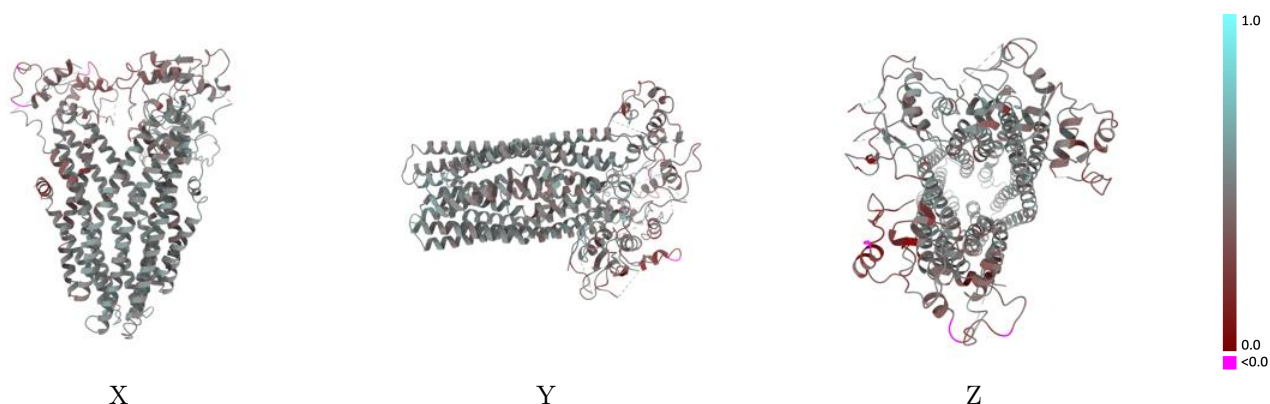
Y



Z

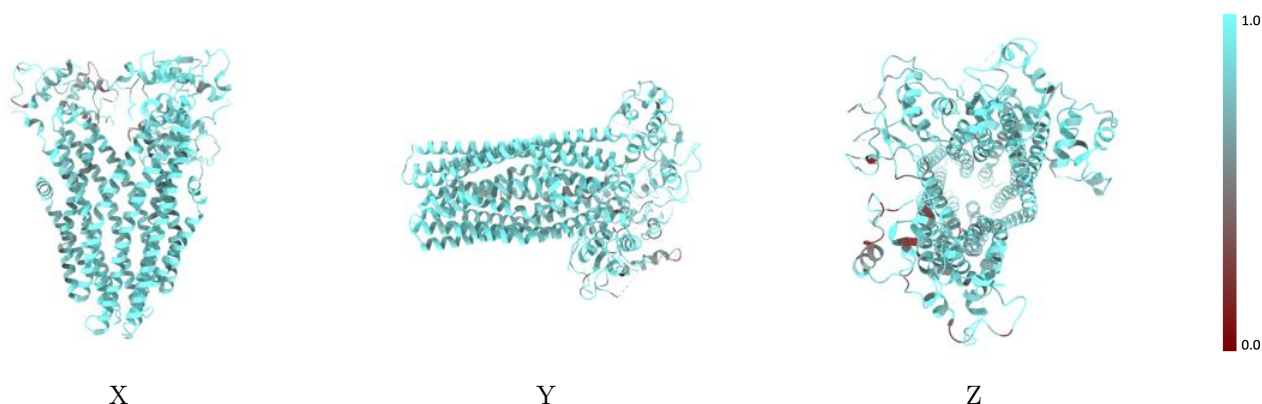
The images above show the 3D surface view of the map at the recommended contour level 0.15 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



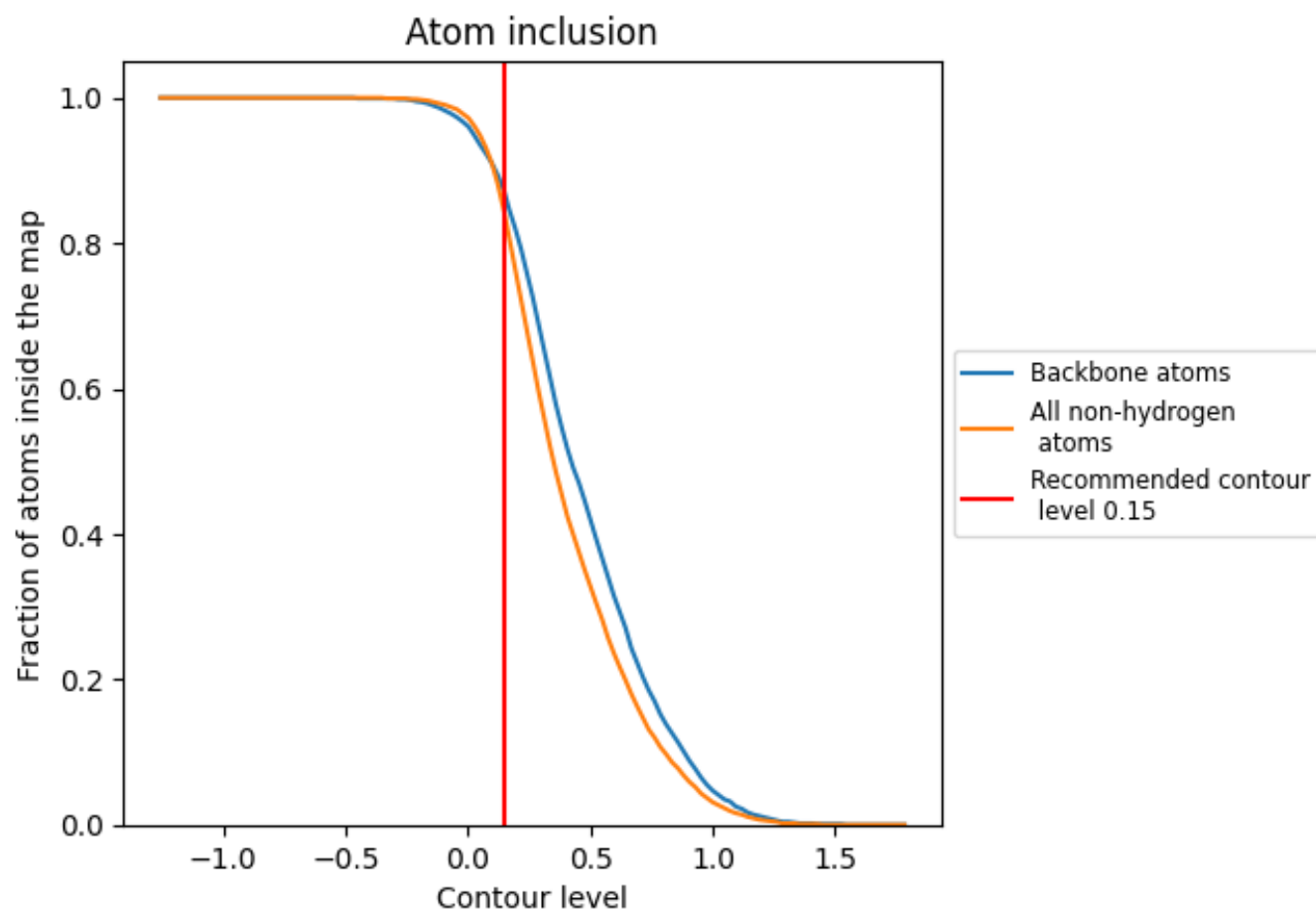
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.15).

9.4 Atom inclusion [i](#)



At the recommended contour level, 87% 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 (0.15) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8410	0.4530
A	0.8280	0.4350
B	0.8500	0.4670

