



Full wwPDB EM Validation Report ⓘ

Jul 9, 2025 – 06:16 PM EDT

PDB ID : 9MDJ / pdb_00009mdj
EMDB ID : EMD-48172
Title : Clostridioides difficile Transferase B Component Dimer in Complex with the A Component
Authors : Sheedlo, M.J.; Mullard, R.M.
Deposited on : 2024-12-05
Resolution : 5.17 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.dev118
MolProbity : 4-5-2 with Phenix2.0rc1
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

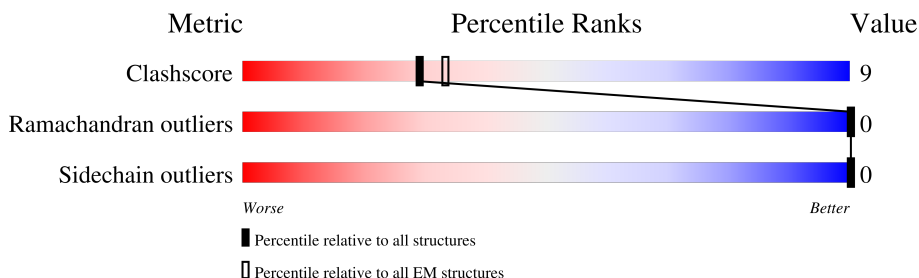
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 5.17 Å.

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



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for ≥ 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	876	
1	B	876	
2	Z	424	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 11358 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 Adp-ribosyltransferase binding component.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	523	Total	C	N	O	S	0	0
			4076	2545	664	862	5		
1	B	520	Total	C	N	O	S	0	0
			4057	2532	659	860	6		

- Molecule 2 is a protein called Cdta (Adp-ribosyltransferase enzymatic component).

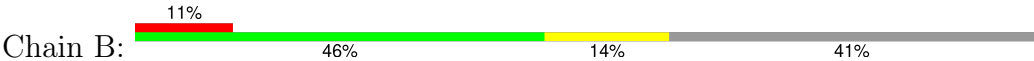
Mol	Chain	Residues	Atoms					AltConf	Trace
2	Z	397	Total	C	N	O	S	0	0
			3219	2049	537	628	5		

- Molecule 3 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		AltConf
3	A	3	Total	Ca	0
			3	3	
3	B	3	Total	Ca	0
			3	3	

LEU
LEU
VAL
LEU
SER
VAL
ASP

• Molecule 1: Adp-ribosyltransferase binding component



MET
LYS
ILE
GLN
MET
ARG
ASN
LYS
LYS
VAL
LEU
MET
PHE
ALA
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GLY
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ALA
ILE
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SER
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ALA
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F249
A250
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K255

K256
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S264
N265
Y271
D272
D273
Y274
E275
K276
G279
S280
F281
D282
K283
A284
A289
R290
D291
P292
L293
Y294
A295
A296
Y297
V300
G301
V302
G303
M304
E305
K306
L307
I308
N312
E313
HIS
ALA
SER
THR
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G320
K321
S324
R325
T328
N329
T332
E333
S334

A337
A338
V339
T354
T355
N356
H359
T360
T361
D362
N363
S364
T365
A366
E373
S374
W375
S380
I381
N382
K383
G384
E385
S386
A387
Y388
I389
N390
N392
V393
R394
Y395
Y396
N397
A401
P402
T407
P408
T409
T410
L414
D415
G416
D417
T418
L419
S420
T421
I422
K423
A424

Q428
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S445
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E552
K553
A557
S574
D581
T584
Y601
M609
K614
T615
P616
F622
T638
S646
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N651
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T658
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F671
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Y674
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I723
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M735
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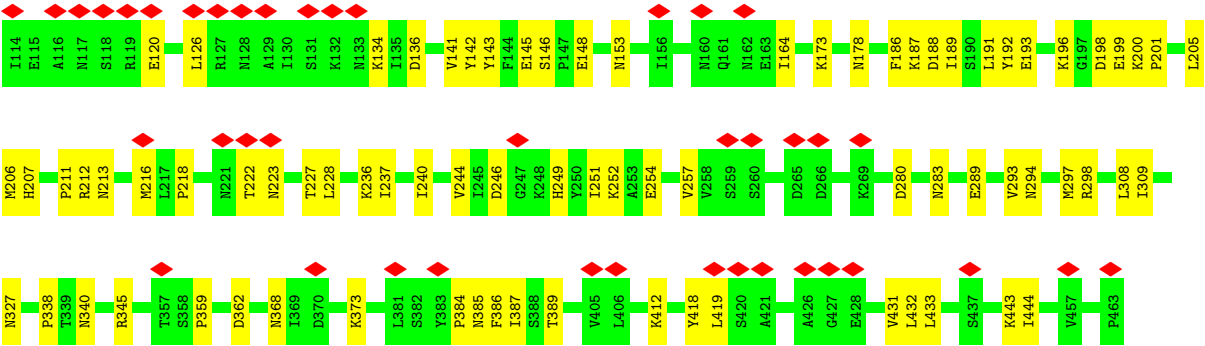
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LEU
LYS
ASP
GLY
THR
PHE
GLY
LYS
ALA
K67

• Molecule 2: Cdta (Adp-ribosyltransferase enzymatic component)



TYR
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CYS
ASN
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THR
THR
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LYS
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PRO
GLU
ASP
PHE
LEU
LYS
LYS
ASP
GLY
THR
LYS
LYS
ALA
K67
E70
R71
E72
E73
A74
E75
R76
I77
E78
Q79
R80
L81
E82
R83
S84
E85
R86
L89
E90
S91
Y92
K93
K94
Y102
Y110
D111
Y112
Q113



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	21744	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	1500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.921	Depositor
Minimum map value	-0.195	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.031	Depositor
Recommended contour level	0.2	Depositor
Map size (Å)	292.4, 292.4, 292.4	wwPDB
Map dimensions	340, 340, 340	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.85999995, 0.85999995, 0.85999995	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: CA

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	0.20	0/4145	0.52	0/5626
1	B	0.19	0/4126	0.50	0/5598
2	Z	0.16	0/3288	0.45	0/4437
All	All	0.19	0/11559	0.49	0/15661

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	4076	0	3964	79	0
1	B	4057	0	3933	72	0
2	Z	3219	0	3198	54	0
3	A	3	0	0	0	0
3	B	3	0	0	0	0
All	All	11358	0	11095	205	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 (205) 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:675:SER:O	1:A:704:TYR:HA	1.63	0.95
1:B:386:SER:HA	1:B:462:ILE:O	1.73	0.87
2:Z:136:ASP:O	2:Z:212:ARG:NH1	2.26	0.69
1:A:441:LYS:H	1:A:444:LEU:HD12	1.59	0.66
1:B:337:ALA:HA	1:B:742:ASN:HD21	1.61	0.64
1:A:547:ILE:HB	1:A:601:TYR:HA	1.79	0.64
1:A:394:ARG:HG2	1:A:440:PRO:HG2	1.81	0.63
1:B:325:ARG:NH2	1:B:373:GLU:OE2	2.32	0.63
2:Z:73:GLU:HA	2:Z:76:ARG:HB2	1.81	0.63
2:Z:418:TYR:HA	2:Z:431:VAL:HG12	1.79	0.63
2:Z:178:ASN:HA	2:Z:236:LYS:HE2	1.81	0.62
1:A:238:LYS:HE2	1:A:243:VAL:HG11	1.82	0.62
1:B:667:LYS:HA	1:B:743:SER:HA	1.82	0.61
1:B:397:ASN:HD21	1:B:433:LEU:HG	1.66	0.61
1:B:390:ASN:ND2	1:B:450:ASN:OD1	2.34	0.60
1:A:663:LEU:O	1:A:716:LYS:NZ	2.34	0.60
2:Z:385:ASN:ND2	2:Z:386:PHE:O	2.35	0.60
2:Z:196:LYS:HE3	2:Z:246:ASP:H	1.66	0.60
1:B:651:ASN:HA	1:B:729:GLY:HA2	1.84	0.60
1:A:302:VAL:O	1:A:363:ASN:ND2	2.35	0.60
2:Z:142:TYR:HB3	2:Z:205:LEU:HD11	1.85	0.59
1:A:279:GLY:O	1:A:283:LYS:NZ	2.35	0.59
1:A:425:GLN:OE1	1:A:428:GLN:NE2	2.36	0.59
1:A:533:LYS:HD2	1:A:544:GLU:HB3	1.85	0.58
1:B:387:ALA:O	1:B:461:PRO:HA	2.03	0.58
2:Z:198:ASP:O	2:Z:200:LYS:NZ	2.37	0.58
1:B:234:GLY:HA3	1:B:256:LYS:HD2	1.85	0.58
2:Z:145:GLU:OE2	2:Z:187:LYS:NZ	2.36	0.58
2:Z:199:GLU:HG2	2:Z:201:PRO:HD3	1.84	0.58
1:B:389:ILE:HG12	1:B:462:ILE:HD11	1.85	0.58
1:B:547:ILE:HB	1:B:601:TYR:HA	1.86	0.58
1:A:675:SER:HB2	1:A:700:PRO:HB3	1.86	0.58
1:B:622:PHE:O	1:B:646:SER:OG	2.22	0.57
1:A:579:ILE:HB	1:A:612:LEU:HB3	1.85	0.57
1:B:293:LEU:HD12	1:B:553:LYS:HE2	1.85	0.57
2:Z:207:HIS:ND1	2:Z:254:GLU:OE1	2.36	0.57
1:B:689:LYS:HD3	1:B:722:GLU:HG3	1.86	0.57
1:A:674:TYR:HA	1:A:705:THR:O	2.05	0.57
2:Z:141:VAL:O	2:Z:207:HIS:HA	2.05	0.57
2:Z:186:PHE:HB3	2:Z:228:LEU:HD11	1.86	0.57
1:B:486:ASN:ND2	1:B:501:ASN:O	2.30	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:658:ILE:HG23	1:B:721:ILE:HB	1.85	0.57
1:A:414:LEU:HD13	1:A:476:ILE:HG12	1.86	0.57
2:Z:148:GLU:HG3	2:Z:153:ASN:HA	1.87	0.56
1:A:260:ASN:HD21	1:A:542:THR:HA	1.69	0.56
1:B:388:TYR:HA	1:B:460:ILE:O	2.05	0.56
1:B:392:ASN:ND2	1:B:446:PRO:O	2.38	0.56
1:B:689:LYS:HB3	1:B:722:GLU:H	1.71	0.56
1:A:665:PRO:HB3	1:A:716:LYS:HE3	1.88	0.56
2:Z:359:PRO:O	2:Z:368:ASN:ND2	2.39	0.56
1:A:397:ASN:O	1:A:436:GLY:N	2.35	0.55
1:B:334:SER:O	1:B:356:ASN:ND2	2.40	0.55
1:B:394:ARG:NH2	1:B:444:LEU:O	2.34	0.55
1:A:689:LYS:HB2	1:A:722:GLU:HB2	1.89	0.55
1:B:397:ASN:HB2	1:B:435:PRO:HA	1.88	0.54
2:Z:89:LEU:HG	2:Z:93:LYS:HE3	1.89	0.54
1:B:687:LYS:HB3	1:B:724:THR:HB	1.88	0.54
1:A:683:SER:HA	1:A:700:PRO:HD2	1.88	0.54
2:Z:70:GLU:OE2	2:Z:227:THR:OG1	2.26	0.54
1:A:304:MET:SD	1:A:327:THR:OG1	2.62	0.54
1:A:679:LEU:HD23	1:A:682:ASN:HB2	1.90	0.54
1:B:676:LYS:HE2	1:B:678:PRO:HG3	1.88	0.54
1:B:546:THR:OG1	1:B:549:GLU:OE1	2.25	0.54
1:A:301:GLY:HA2	1:A:480:THR:HG21	1.89	0.53
1:B:674:TYR:HD2	1:B:704:TYR:HB3	1.72	0.53
1:A:373:GLU:H	1:A:748:LEU:HD11	1.73	0.53
1:A:670:VAL:HG22	1:A:710:GLU:HG3	1.90	0.53
1:A:236:THR:HG21	1:A:249:PHE:HE2	1.73	0.53
1:A:558:THR:HB	1:A:565:TYR:HB2	1.89	0.53
1:B:392:ASN:HD22	1:B:446:PRO:HG2	1.73	0.53
1:A:521:THR:HA	1:A:615:THR:HB	1.89	0.53
1:A:691:LYS:HD3	1:A:714:THR:HG21	1.89	0.53
1:A:438:THR:OG1	1:A:440:PRO:O	2.26	0.53
1:B:276:LYS:HD3	1:B:292:PRO:HA	1.91	0.52
1:B:479:GLU:N	1:B:479:GLU:OE2	2.43	0.52
1:A:245:TRP:CD2	1:A:256:LYS:HB2	2.44	0.52
1:A:560:LYS:HB3	1:A:563:LEU:HB2	1.92	0.52
1:B:303:GLY:HA3	1:B:329:ASN:HD22	1.75	0.52
1:B:552:GLU:HA	1:B:557:ALA:HB3	1.92	0.52
2:Z:345:ARG:HB2	2:Z:389:THR:HG22	1.92	0.51
2:Z:443:LYS:NZ	2:Z:444:ILE:O	2.42	0.51
1:B:487:PHE:O	1:B:501:ASN:ND2	2.43	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:Z:419:LEU:HD11	2:Z:432:LEU:HB2	1.92	0.51
2:Z:338:PRO:O	2:Z:412:LYS:NZ	2.36	0.51
1:A:293:LEU:HD21	1:A:543:PRO:HG2	1.93	0.51
1:A:719:SER:OG	1:A:720:ASN:N	2.44	0.51
1:B:677:ASP:N	1:B:701:GLU:O	2.41	0.50
1:B:685:ILE:HD12	1:B:697:TYR:HE1	1.76	0.50
1:B:673:GLY:HA3	1:B:736:LEU:HD13	1.94	0.50
1:A:701:GLU:HG2	1:A:703:GLY:H	1.76	0.50
1:A:655:LYS:HD2	1:A:724:THR:HG22	1.94	0.50
1:B:308:ILE:HG12	1:B:324:SER:HB2	1.94	0.50
1:B:402:PRO:HB3	1:B:434:SER:HA	1.93	0.49
1:A:481:THR:HG22	1:A:482:GLN:HG3	1.92	0.49
1:B:240:LEU:O	1:B:274:TYR:OH	2.28	0.49
1:A:684:ILE:HG22	1:A:727:GLY:HA2	1.94	0.49
2:Z:76:ARG:O	2:Z:79:GLN:NE2	2.41	0.49
1:A:218:ASP:OD1	1:A:218:ASP:N	2.45	0.49
1:A:654:THR:HB	1:A:725:LEU:HG	1.94	0.49
1:B:263:GLU:HG3	1:B:265:ASN:H	1.77	0.49
1:B:651:ASN:OD1	1:B:652:GLY:N	2.46	0.49
2:Z:111:ASP:N	2:Z:111:ASP:OD1	2.45	0.48
2:Z:387:ILE:HB	2:Z:433:LEU:HB3	1.95	0.48
1:A:671:PHE:O	1:A:708:SER:HA	2.13	0.48
2:Z:222:THR:OG1	2:Z:223:ASN:N	2.46	0.48
1:B:359:HIS:HB2	1:B:361:THR:HG22	1.95	0.48
1:A:272:THR:HG23	1:A:275:GLU:H	1.77	0.48
2:Z:92:TYR:HB2	2:Z:126:LEU:HD11	1.96	0.48
1:B:306:LYS:HD3	1:B:308:ILE:HG13	1.95	0.48
1:B:397:ASN:ND2	1:B:433:LEU:HG	2.29	0.48
1:A:617:THR:OG1	1:A:738:ILE:O	2.28	0.48
1:A:235:TYR:HD2	1:A:257:TYR:HB2	1.79	0.47
1:A:379:LEU:HB3	1:A:381:ILE:HG12	1.96	0.47
1:A:228:ASP:HA	1:A:231:GLU:HB2	1.96	0.47
1:B:308:ILE:HB	1:B:390:ASN:HB3	1.97	0.47
2:Z:146:SER:OG	2:Z:148:GLU:OE1	2.32	0.47
1:A:245:TRP:NE1	1:A:247:ASP:OD1	2.44	0.47
1:A:687:LYS:HG2	1:A:689:LYS:HD3	1.96	0.47
2:Z:142:TYR:HE2	2:Z:252:LYS:HE3	1.79	0.47
2:Z:289:GLU:HA	2:Z:327:ASN:HB3	1.97	0.47
1:B:574:SER:O	1:B:735:ASN:ND2	2.48	0.47
2:Z:134:LYS:HB2	2:Z:213:ASN:HA	1.97	0.46
1:A:271:TYR:OH	1:A:488:GLY:O	2.33	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:Z:340:ASN:OD1	2:Z:412:LYS:N	2.48	0.46
1:A:302:VAL:HG23	1:A:480:THR:HG22	1.96	0.46
1:A:406:VAL:HG11	1:A:429:ILE:HG21	1.98	0.46
1:A:309:ILE:O	1:A:322:THR:HA	2.14	0.46
1:A:599:LYS:HG3	1:A:602:ASN:H	1.79	0.46
1:B:686:VAL:HG12	1:B:725:LEU:HG	1.98	0.46
1:B:671:PHE:O	1:B:708:SER:HA	2.16	0.46
2:Z:294:ASN:O	2:Z:298:ARG:HB2	2.16	0.46
2:Z:143:TYR:HB2	2:Z:189:ILE:HG22	1.97	0.46
1:B:487:PHE:HB3	1:B:503:TRP:CE2	2.51	0.46
2:Z:191:LEU:HD21	2:Z:216:MET:HE1	1.98	0.45
1:A:513:ILE:HG23	1:A:607:ARG:HH21	1.81	0.45
1:B:520:ASP:HB3	1:B:614:LYS:HD2	1.98	0.45
1:B:616:PRO:HA	1:B:739:THR:HG22	1.98	0.45
1:A:294:VAL:HG22	1:A:530:VAL:HG22	1.98	0.45
1:A:406:VAL:HG12	1:A:408:PRO:HD3	1.97	0.45
1:B:283:LYS:HE3	1:B:283:LYS:HB3	1.81	0.44
1:A:308:ILE:HG13	1:A:390:ASN:HB3	1.98	0.44
1:B:682:ASN:OD1	1:B:730:THR:OG1	2.35	0.44
2:Z:188:ASP:OD1	2:Z:188:ASP:N	2.45	0.44
1:A:636:ASN:HB2	1:A:649:LYS:HB2	1.98	0.44
2:Z:77:ILE:HD12	2:Z:218:PRO:HD2	2.00	0.44
2:Z:236:LYS:NZ	2:Z:237:ILE:O	2.50	0.44
2:Z:309:ILE:HD13	2:Z:384:PRO:HG2	2.00	0.44
1:A:273:ASP:HA	1:A:276:LYS:HE2	1.98	0.44
1:A:440:PRO:HG3	1:A:447:LEU:HD23	2.00	0.44
1:A:557:ALA:HA	1:A:565:TYR:O	2.18	0.44
1:B:408:PRO:HA	1:B:483:VAL:HG12	1.99	0.43
1:A:289:ALA:HB2	1:A:400:THR:HB	2.00	0.43
1:A:651:ASN:HA	1:A:729:GLY:HA2	2.00	0.43
1:B:333:GLU:HB3	1:B:364:SER:HB3	2.00	0.43
2:Z:102:TYR:OH	2:Z:120:GLU:OE1	2.29	0.43
1:B:394:ARG:HE	1:B:440:PRO:HD2	1.84	0.43
1:A:640:GLN:HA	1:A:646:SER:HA	2.00	0.43
1:A:327:THR:HG22	1:A:367:VAL:HG22	2.00	0.43
2:Z:164:ILE:HD13	2:Z:251:ILE:HG13	2.01	0.43
2:Z:280:ASP:OD1	2:Z:283:ASN:ND2	2.48	0.43
1:B:410:THR:HG23	1:B:422:ILE:HB	1.99	0.42
1:B:653:GLU:HB3	1:B:726:ILE:HG23	2.00	0.42
2:Z:362:ASP:O	2:Z:368:ASN:ND2	2.38	0.42
1:A:636:ASN:OD1	1:A:651:ASN:ND2	2.39	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:339:VAL:HA	1:B:354:THR:HA	2.00	0.42
1:B:249:PHE:HB3	1:B:254:TYR:HD2	1.84	0.42
2:Z:173:LYS:HG2	2:Z:240:ILE:HD11	2.00	0.42
1:A:685:ILE:HG12	1:A:726:ILE:HB	2.02	0.42
2:Z:110:TYR:HB2	2:Z:113:GLN:HG3	2.02	0.42
2:Z:67:LYS:HE2	2:Z:192:TYR:HE1	1.84	0.42
1:A:245:TRP:CD1	1:A:256:LYS:HD3	2.54	0.42
1:A:295:ALA:HB3	1:A:529:ARG:HB2	2.00	0.42
2:Z:142:TYR:HA	2:Z:206:MET:O	2.20	0.42
2:Z:211:PRO:HD3	2:Z:257:VAL:HG21	2.02	0.42
1:A:487:PHE:HB3	1:A:503:TRP:CE2	2.55	0.42
1:B:238:LYS:HE3	1:B:243:VAL:HG11	2.02	0.42
2:Z:293:VAL:O	2:Z:297:MET:HG3	2.21	0.41
1:A:297:TYR:HE1	1:A:507:ILE:HG23	1.85	0.41
1:B:228:ASP:HB2	1:B:232:ARG:NH1	2.35	0.41
1:B:581:ASP:N	1:B:581:ASP:OD1	2.51	0.41
1:A:236:THR:HG21	1:A:249:PHE:CE2	2.54	0.41
2:Z:244:VAL:HG22	2:Z:249:HIS:CD2	2.56	0.41
1:B:231:GLU:HB2	1:B:232:ARG:HH21	1.85	0.41
2:Z:90:GLU:HA	2:Z:93:LYS:HD2	2.02	0.41
2:Z:193:GLU:OE1	2:Z:252:LYS:NZ	2.41	0.41
1:A:310:SER:HB2	1:A:322:THR:HG22	2.02	0.41
1:A:676:LYS:NZ	1:A:702:GLN:O	2.52	0.41
1:B:332:THR:OG1	1:B:520:ASP:OD2	2.24	0.41
1:B:671:PHE:CZ	1:B:736:LEU:HD12	2.56	0.41
1:A:235:TYR:CD2	1:A:257:TYR:HB2	2.55	0.41
1:A:433:LEU:HD23	1:A:433:LEU:HA	1.96	0.41
2:Z:373:LYS:HG2	2:Z:444:ILE:HB	2.04	0.41
1:A:683:SER:O	1:A:728:SER:OG	2.36	0.40
1:B:515:ALA:HB1	1:B:609:MET:HB2	2.03	0.40
1:B:581:ASP:OD1	1:B:584:THR:OG1	2.33	0.40
1:A:245:TRP:CG	1:A:256:LYS:HB2	2.56	0.40
1:A:269:ASP:N	1:A:269:ASP:OD1	2.53	0.40
1:B:417:ASP:OD1	1:B:417:ASP:N	2.46	0.40
2:Z:244:VAL:HG22	2:Z:249:HIS:HD2	1.86	0.40
1:A:664:LYS:HB2	1:A:667:LYS:HG3	2.02	0.40
1:B:302:VAL:O	1:B:363:ASN:ND2	2.45	0.40
2:Z:308:LEU:HD13	2:Z:385:ASN:HA	2.04	0.40
1:B:279:GLY:HA2	1:B:281:PHE:CE2	2.57	0.40
1:B:307:LEU:O	1:B:324:SER:HA	2.20	0.40
1:B:691:LYS:HG3	1:B:714:THR:HB	2.02	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	517/876 (59%)	477 (92%)	40 (8%)	0	100	100
1	B	514/876 (59%)	490 (95%)	24 (5%)	0	100	100
2	Z	395/424 (93%)	386 (98%)	9 (2%)	0	100	100
All	All	1426/2176 (66%)	1353 (95%)	73 (5%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	462/790 (58%)	462 (100%)	0	100	100
1	B	460/790 (58%)	460 (100%)	0	100	100
2	Z	357/382 (94%)	357 (100%)	0	100	100
All	All	1279/1962 (65%)	1279 (100%)	0	100	100

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

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	260	ASN
1	A	392	ASN
1	A	586	ASN
1	B	742	ASN
2	Z	183	GLN
2	Z	385	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 6 ligands modelled in this entry, 6 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.

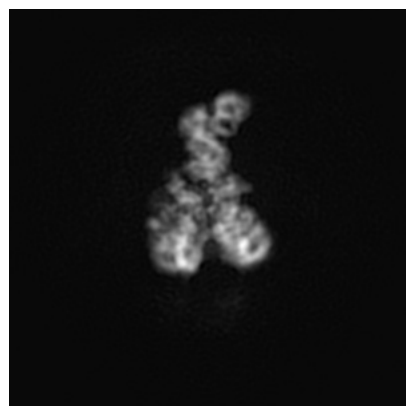
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-48172. These allow visual inspection of the internal detail of the map and identification of artifacts.

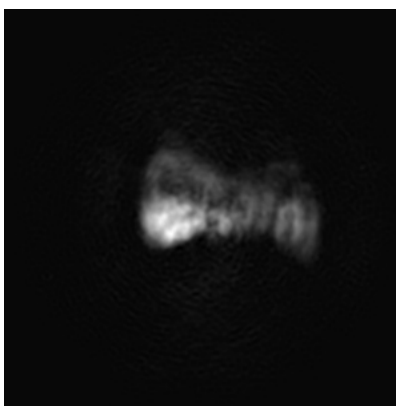
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

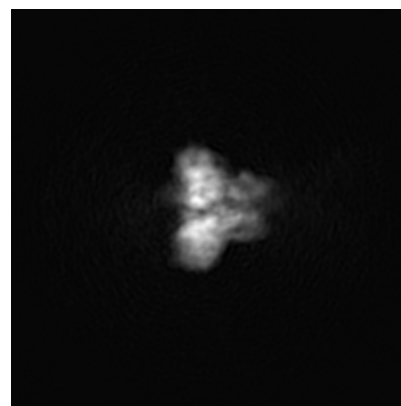
6.1.1 Primary map



X

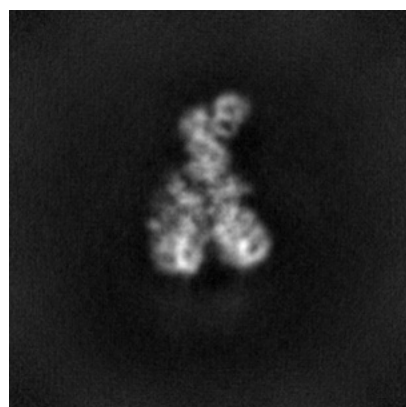


Y

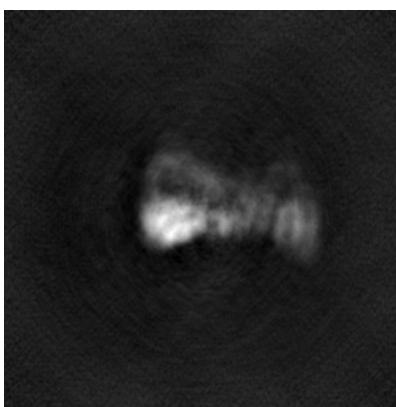


Z

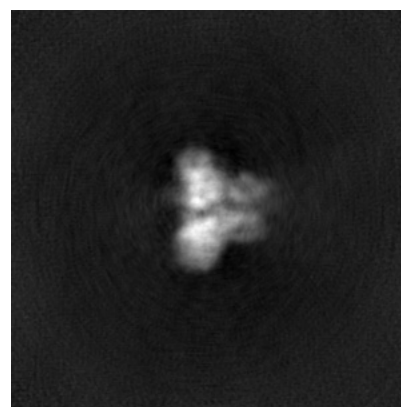
6.1.2 Raw map



X



Y

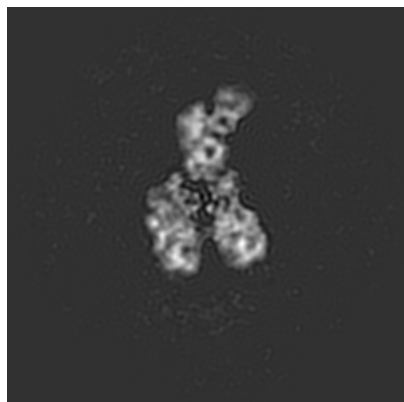


Z

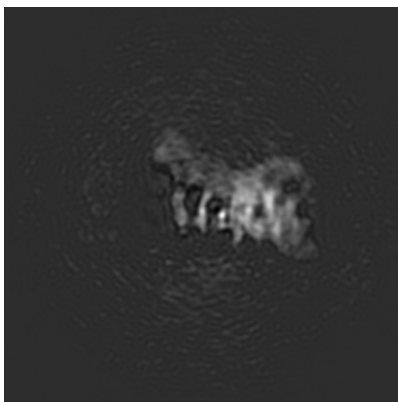
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

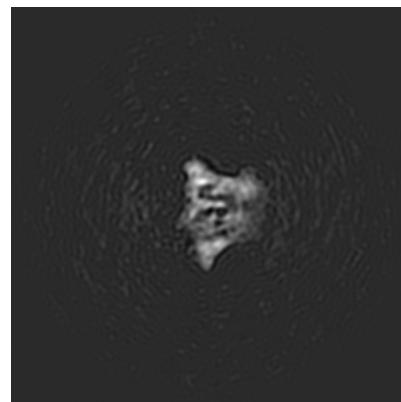
6.2.1 Primary map



X Index: 170

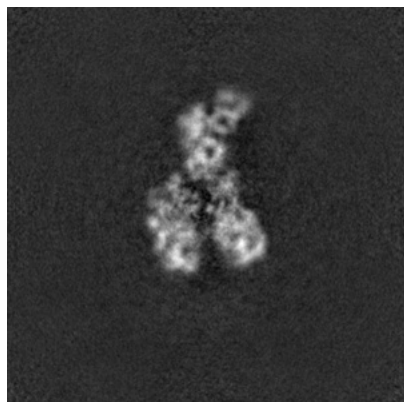


Y Index: 170

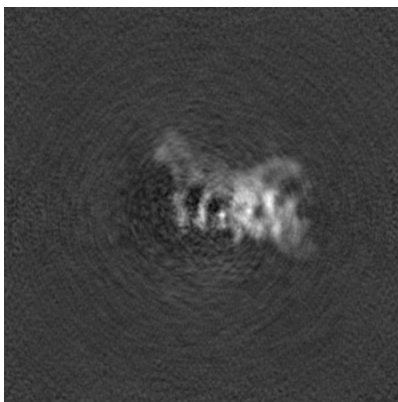


Z Index: 170

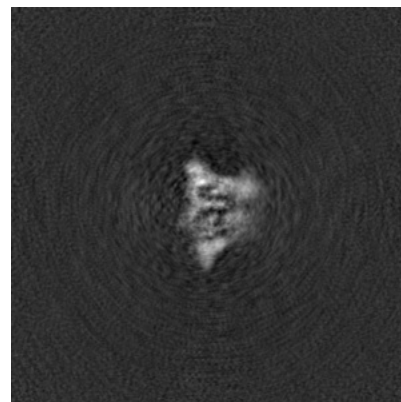
6.2.2 Raw map



X Index: 170



Y Index: 170

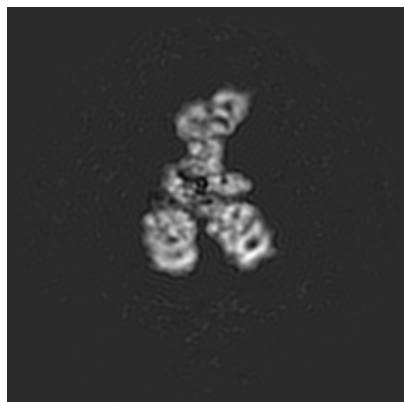


Z Index: 170

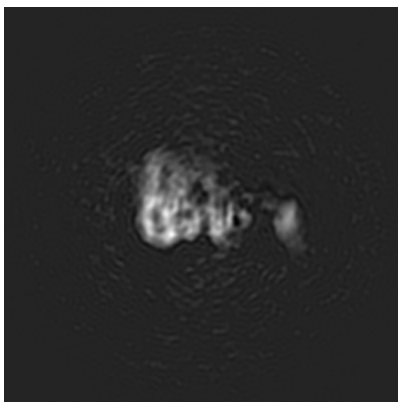
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

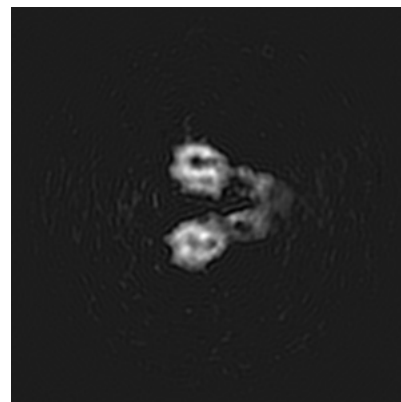
6.3.1 Primary map



X Index: 157

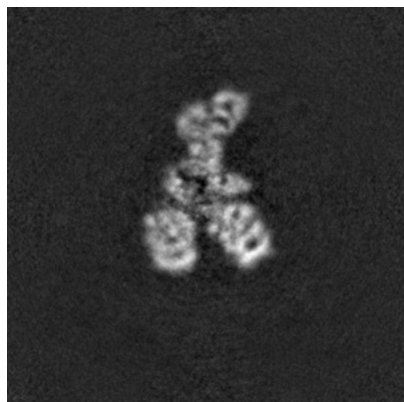


Y Index: 147

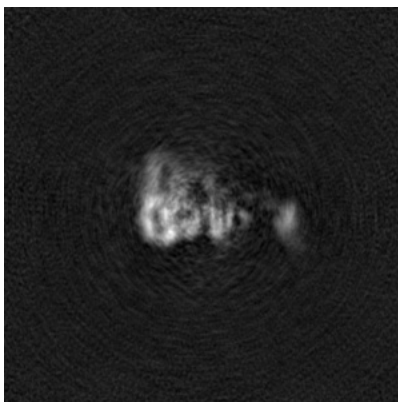


Z Index: 138

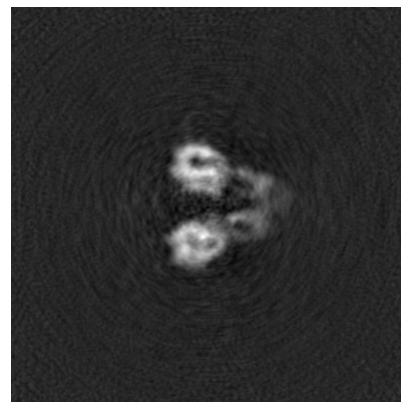
6.3.2 Raw map



X Index: 157



Y Index: 147

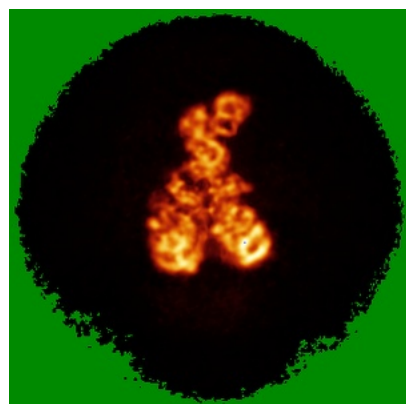


Z Index: 138

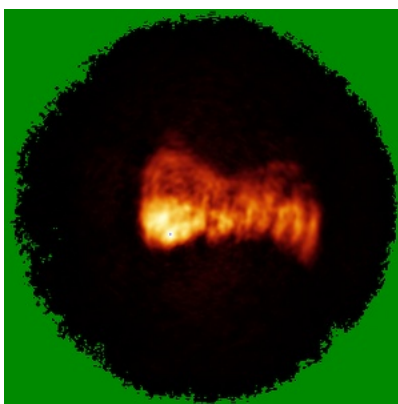
The images above show the largest variance slices of the map in three orthogonal directions.

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

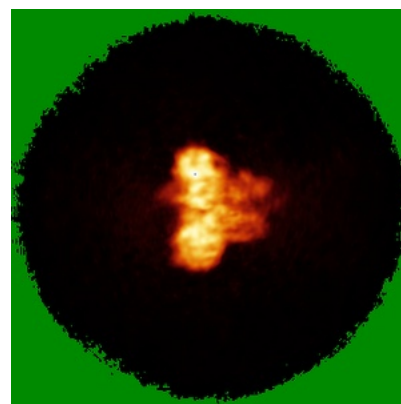
6.4.1 Primary map



X



Y

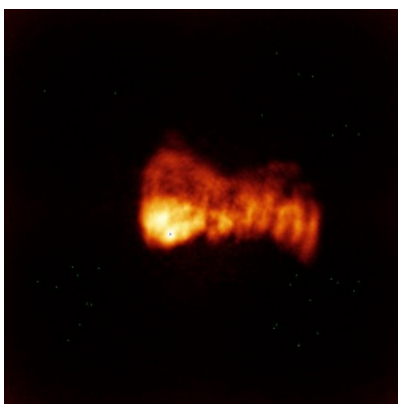


Z

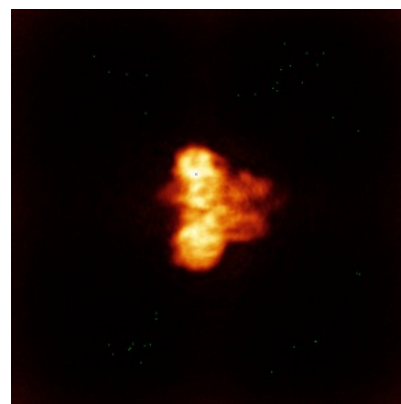
6.4.2 Raw map



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 0.2. 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.

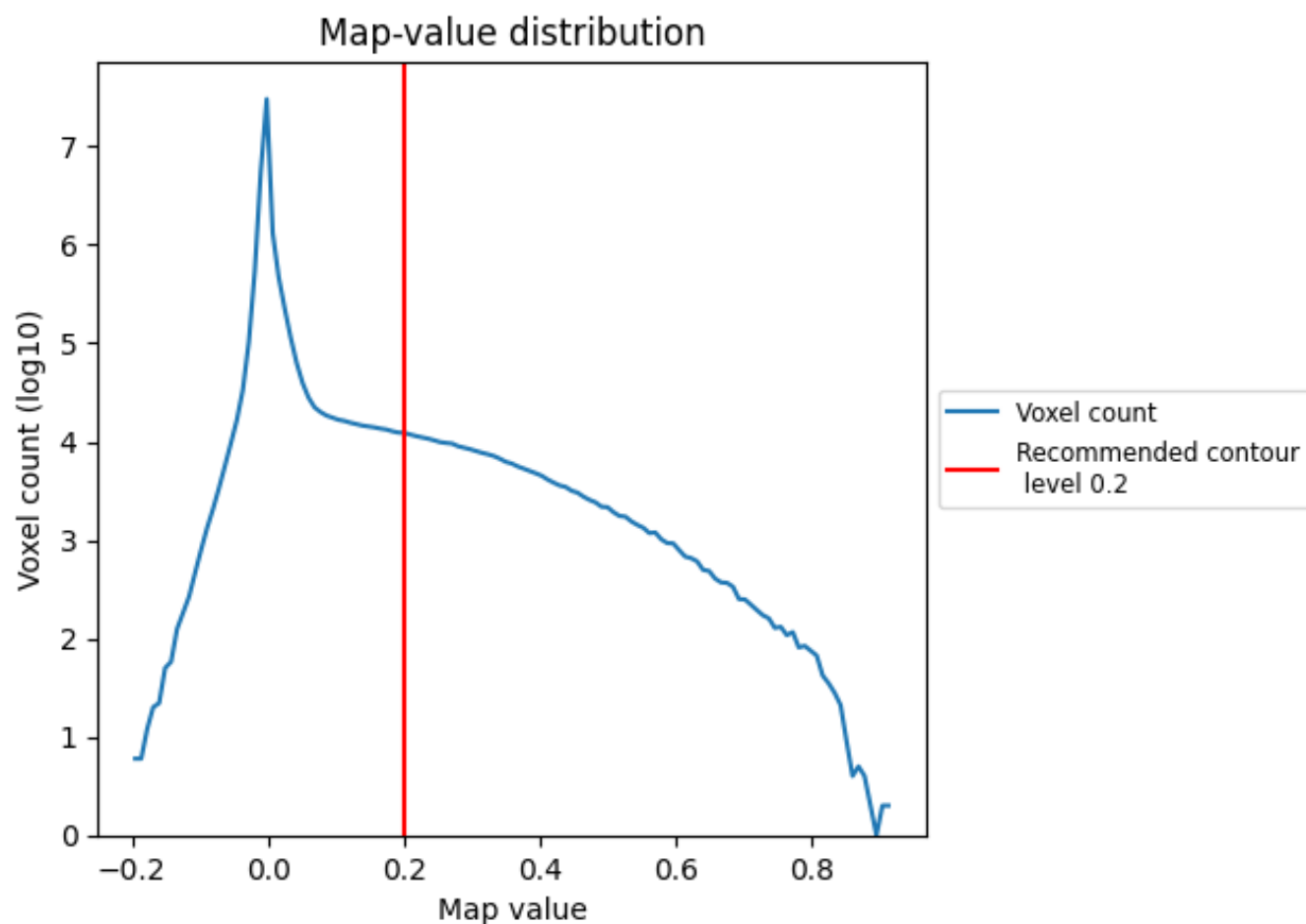
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

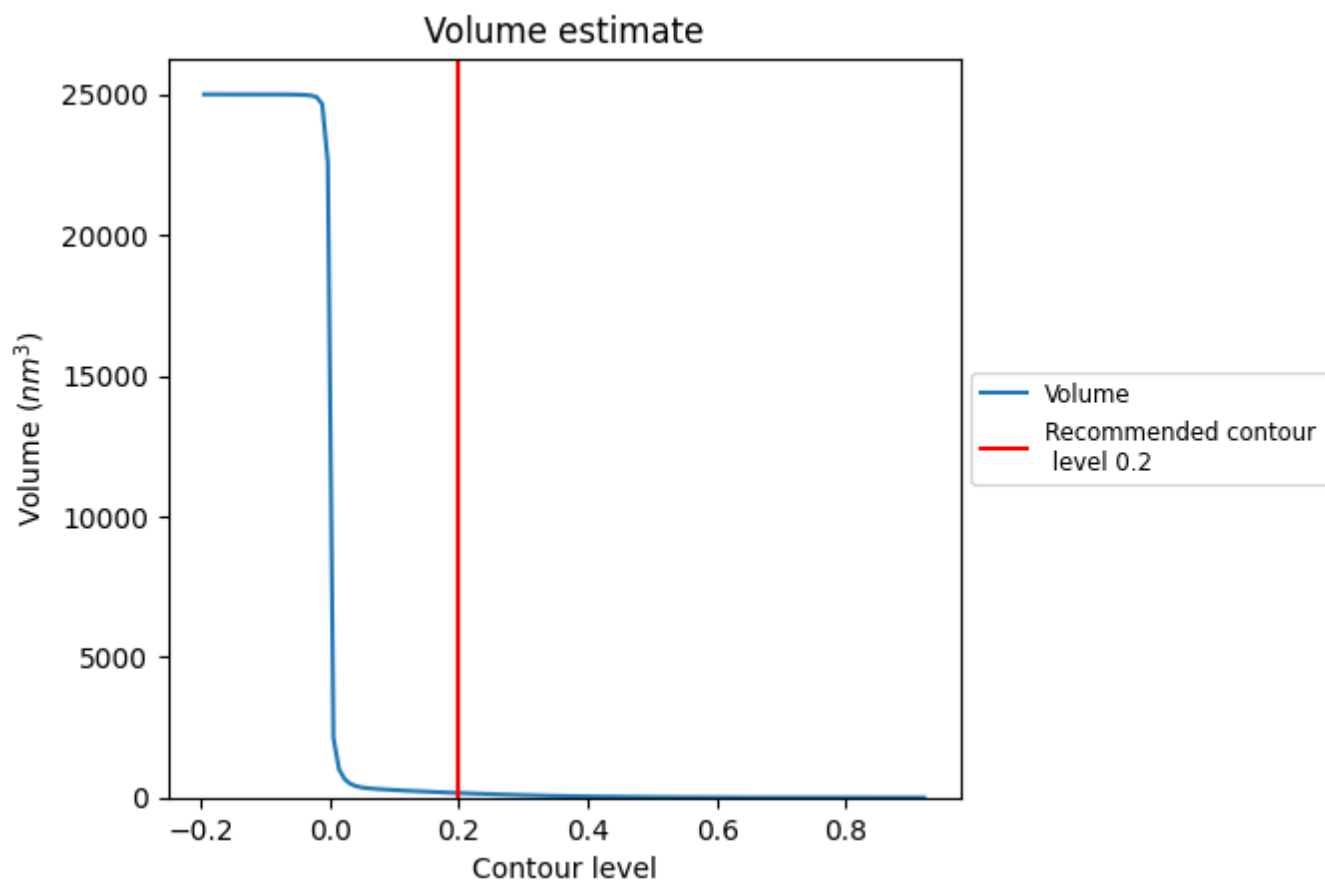
This section contains the results of statistical analysis of the map.

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.

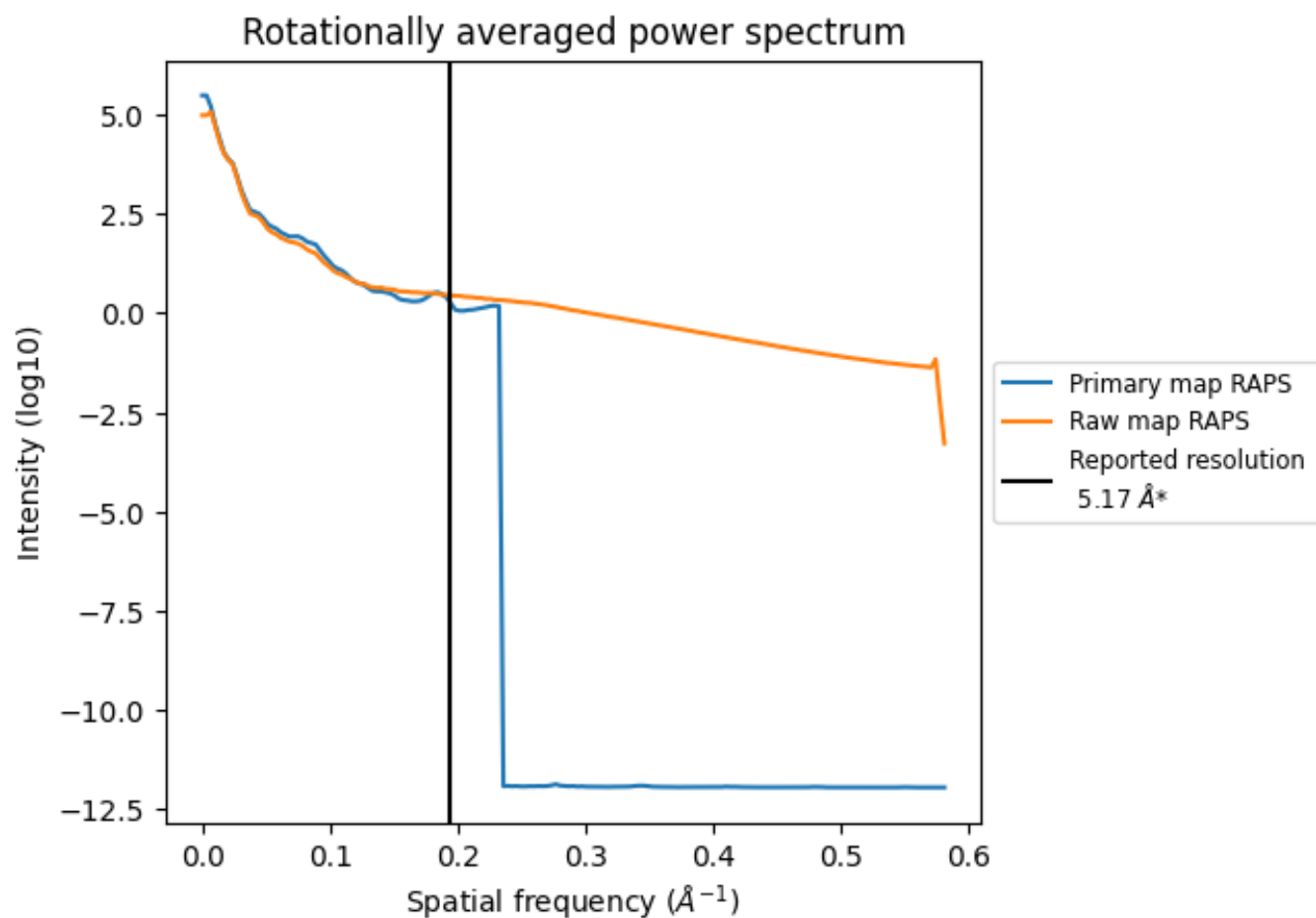
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 161 nm³; this corresponds to an approximate mass of 146 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 ⓘ

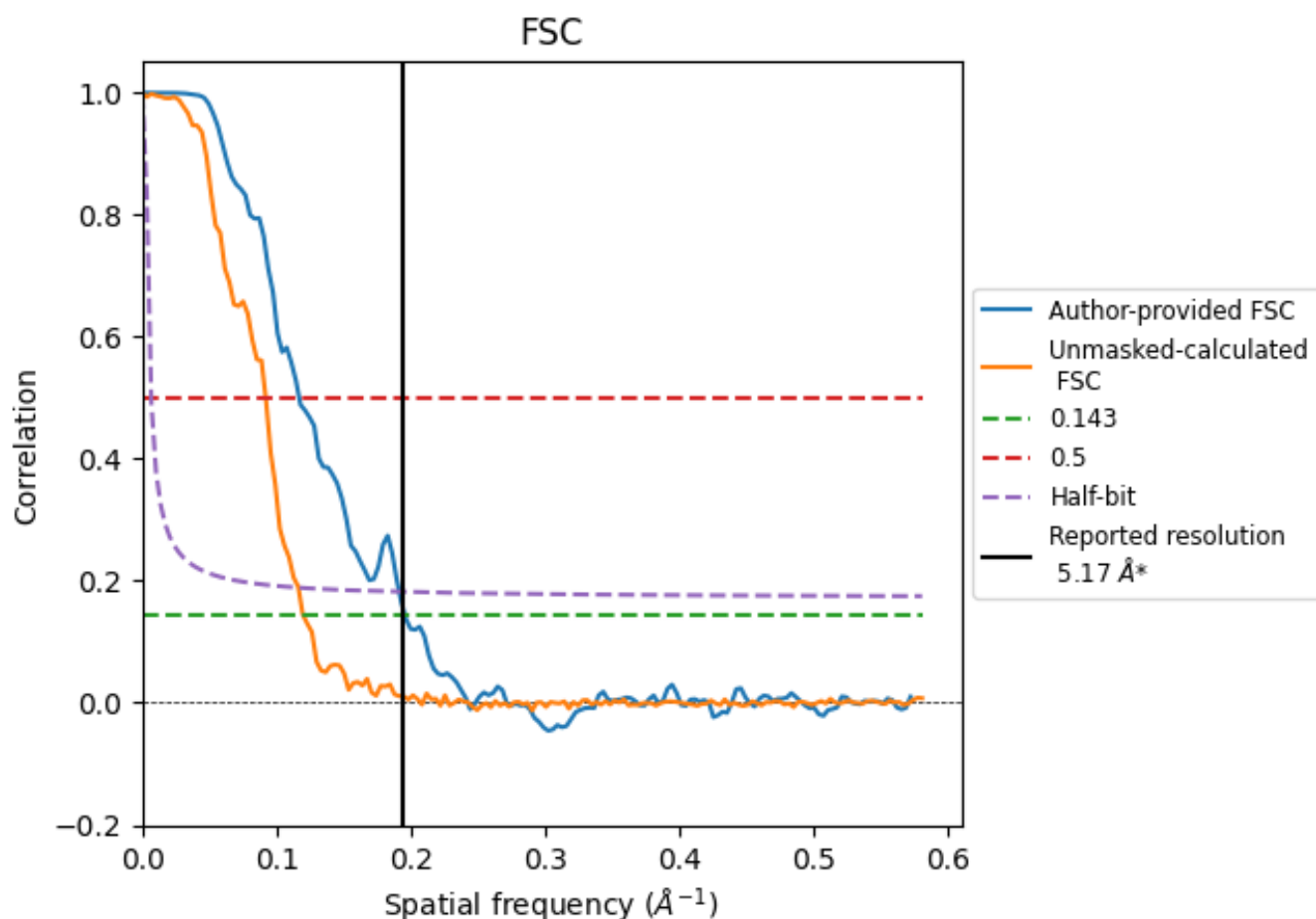


*Reported resolution corresponds to spatial frequency of 0.193 Å⁻¹

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 0.193 \AA^{-1}

8.2 Resolution estimates [i](#)

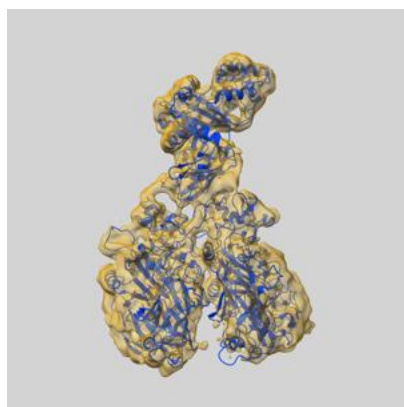
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	5.17	-	-
Author-provided FSC curve	5.10	8.55	5.22
Unmasked-calculated*	8.33	10.86	8.59

*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 8.33 differs from the reported value 5.17 by more than 10 %

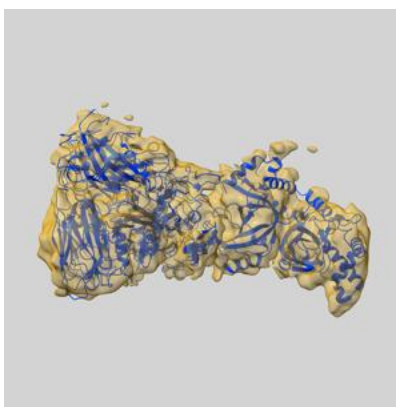
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-48172 and PDB model 9MDJ. Per-residue inclusion information can be found in [section 3](#) on [page 4](#).

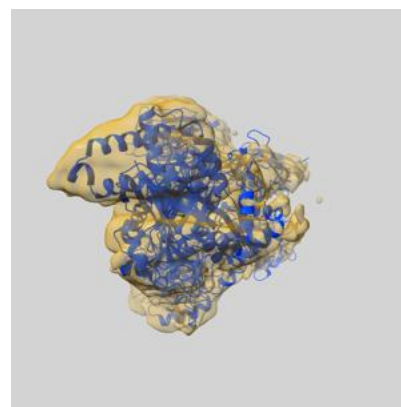
9.1 Map-model overlay [i](#)



X



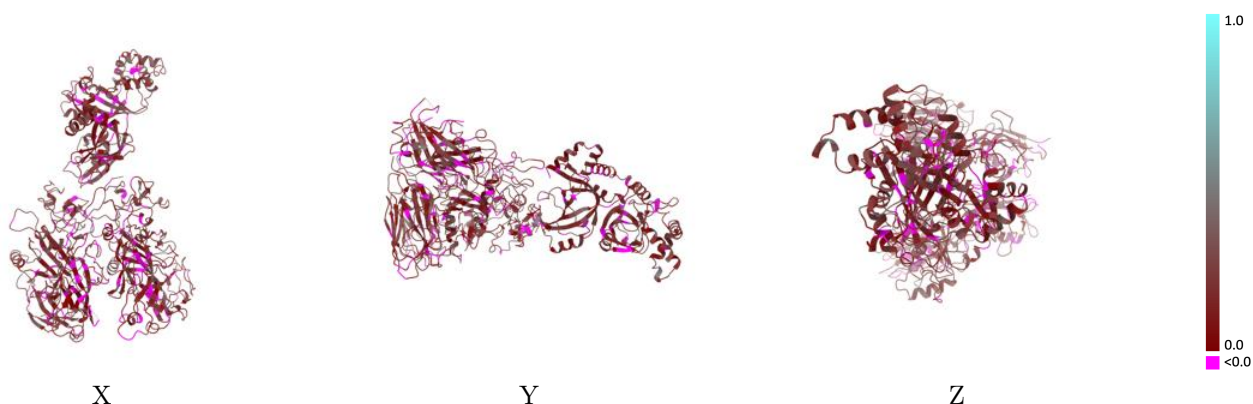
Y



Z

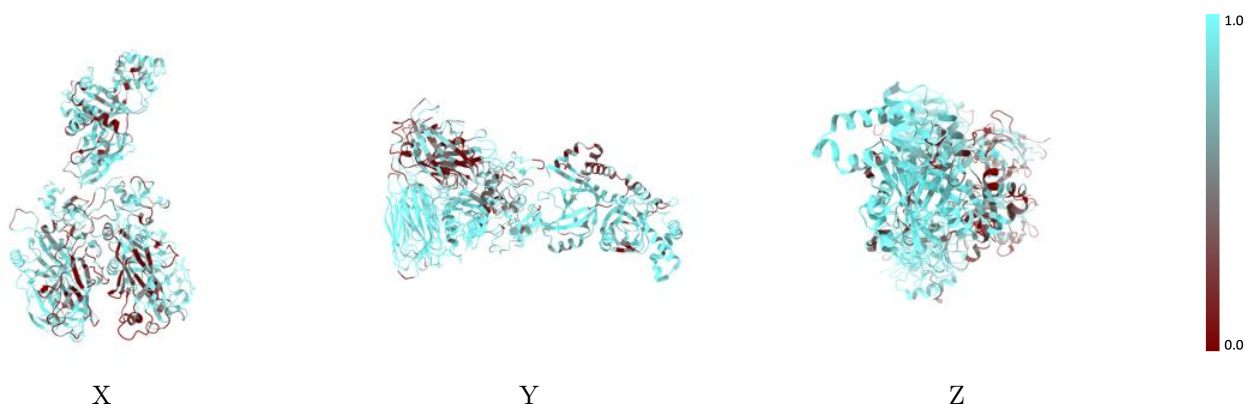
The images above show the 3D surface view of the map at the recommended contour level 0.2 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



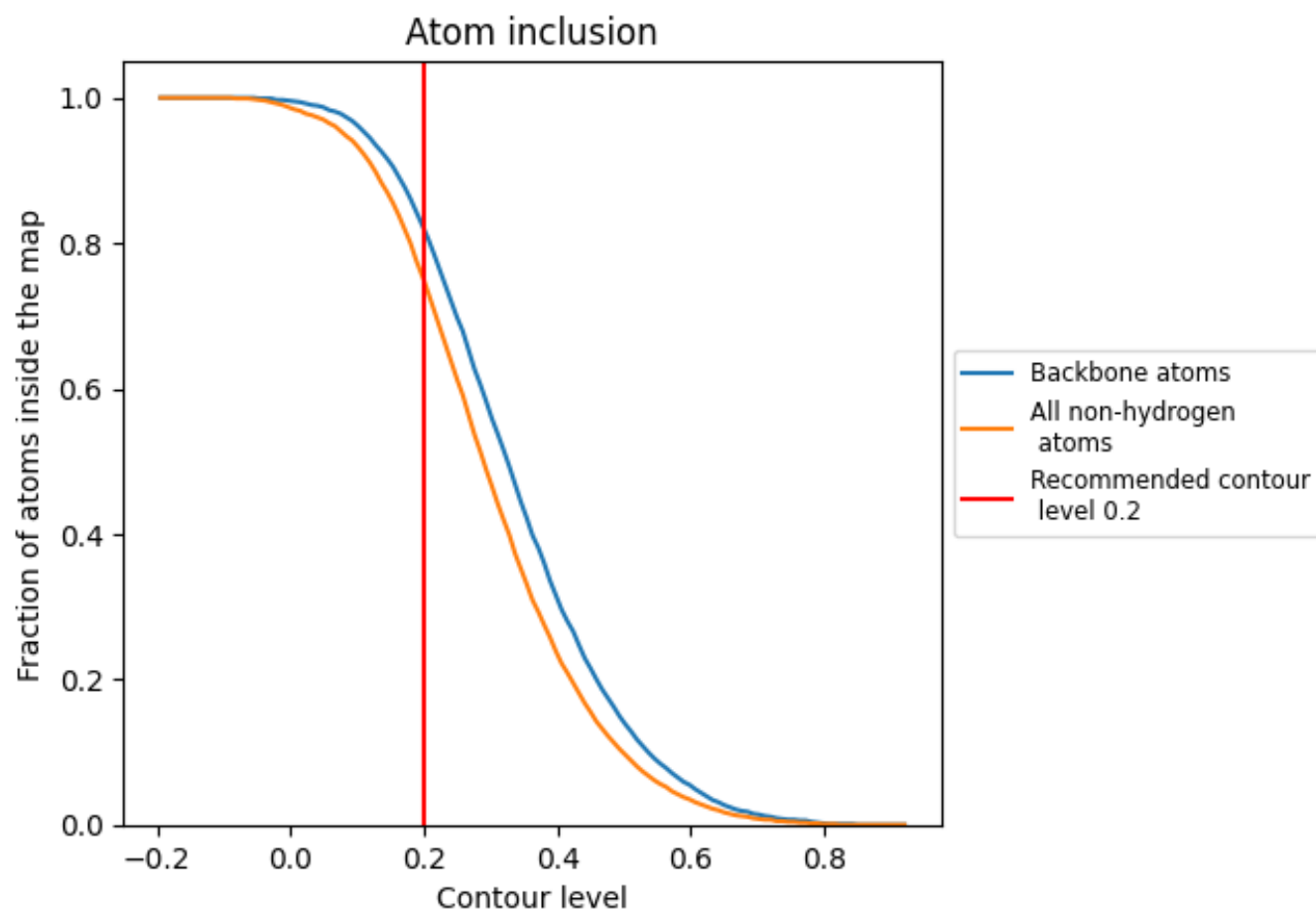
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.2).

9.4 Atom inclusion ⓘ



At the recommended contour level, 82% of all backbone atoms, 75% 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 (0.2) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	<div></div> 0.7490	<div></div> 0.1600
A	<div></div> 0.7280	<div></div> 0.1630
B	<div></div> 0.7450	<div></div> 0.1550
Z	<div></div> 0.7830	<div></div> 0.1640

