



Full wwPDB EM Validation Report ⓘ

Nov 2, 2024 – 08:30 AM EDT

PDB ID : 8D43
EMDB ID : EMD-27173
Title : Cryo-EM structure of human Kidney Glucosidase II
Authors : Lyu, M.; Yu, E.W.
Deposited on : 2022-06-01
Resolution : 2.88 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.dev113
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

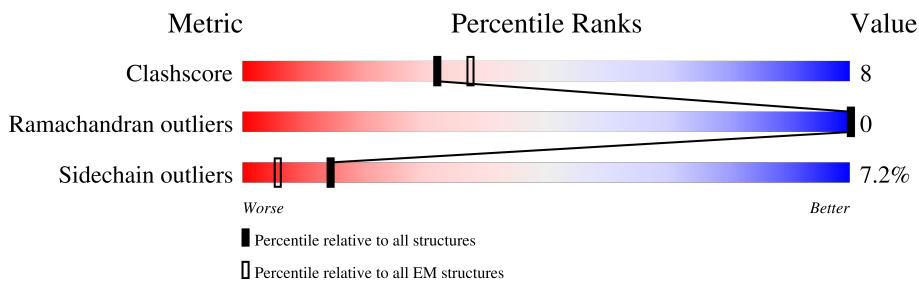
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.88 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	944	
2	B	528	
3	C	4	

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 7763 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 Neutral alpha-glucosidase AB.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	862	6952	4440	1215	1272	25	0	0

- Molecule 2 is a protein called Glucosidase 2 subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	100	758	458	129	161	10	0	0

- Molecule 3 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



Mol	Chain	Residues	Atoms				AltConf	Trace
			Total	C	N	O		
3	C	4	50	28	2	20	0	0

- Molecule 4 is CALCIUM ION (three-letter code: CA) (formula: Ca) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
			Total	Ca	
4	B	2	2	2	0

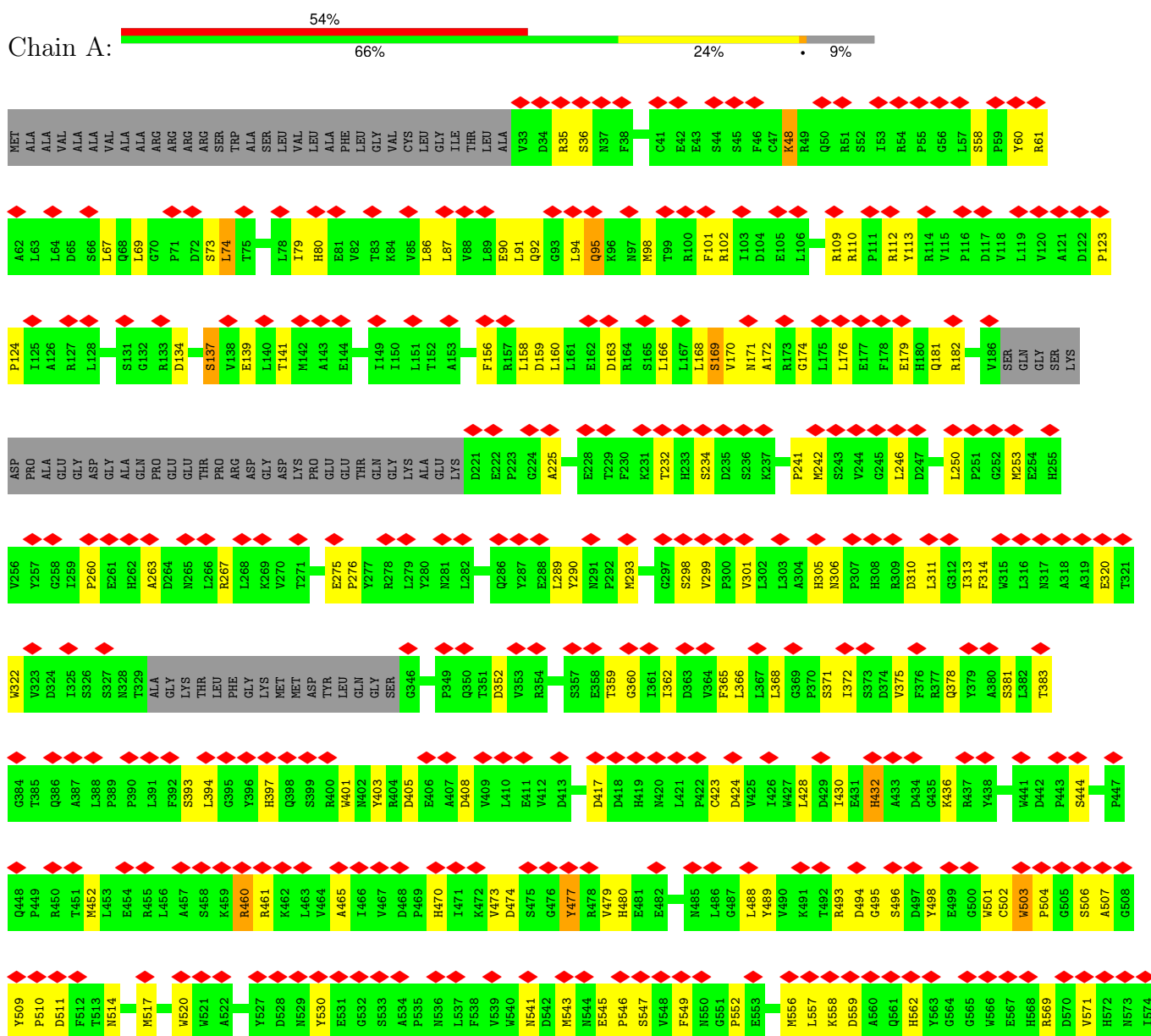
- Molecule 5 is water.

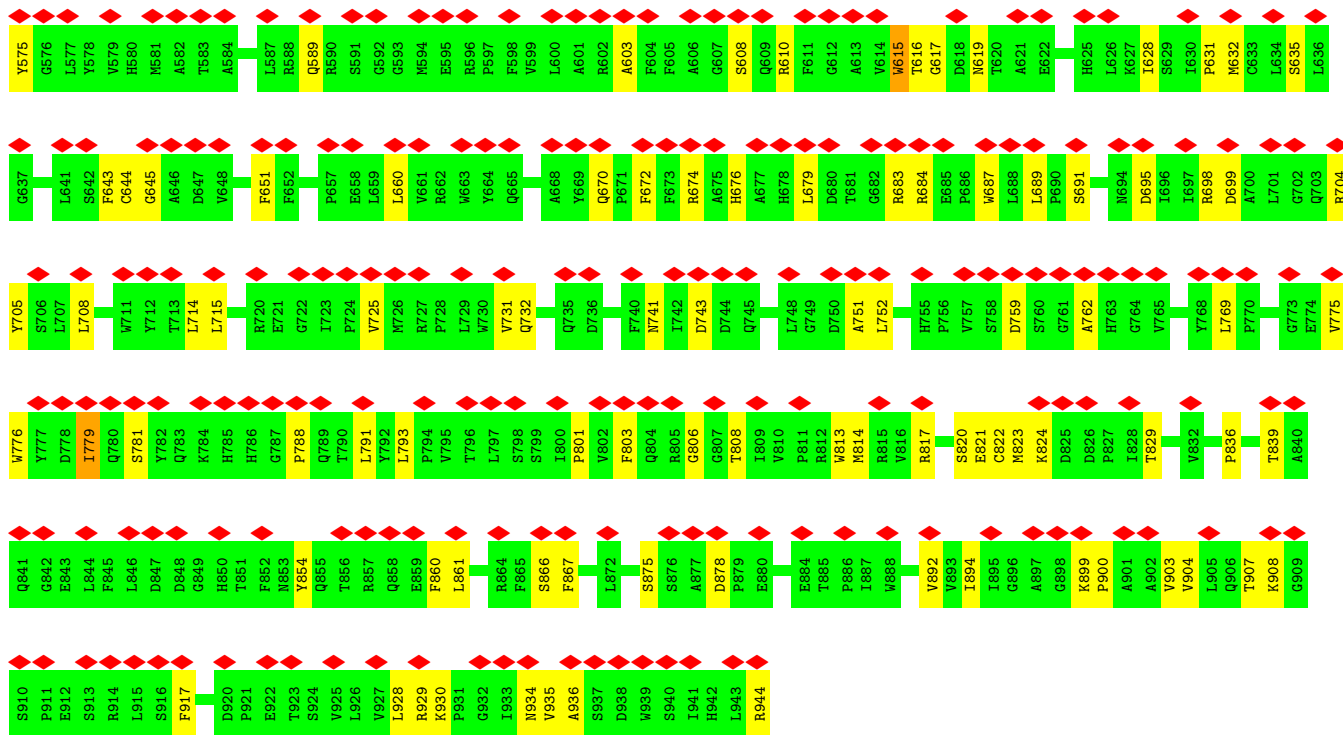
Mol	Chain	Residues	Atoms		AltConf
			Total	O	
5	A	1	1	1	0

3 Residue-property plots

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

• Molecule 1: Neutral alpha-glucosidase AB





• Molecule 2: Glucosidase 2 subunit beta



MET	LEU	LEU	PRO	LEU	LEU	LEU	LEU	PRO	MET	CYS	TRP	ALA	VAL	VAL	K18	R19	P20	E21	L25	T26	H28	H29	F30	Y31	D32	E33	S34	F37	T38	C39	L40	D41	A44	T45	I46	P47	F48	D49	Q50	V51	M52	D53	D54	Y55	C56	D57	C58	K59	D60	G61	S62	D63				
A68	A69	M72	G73	S74	T78	M79	T80	G81	Y82	K83	P84	I87	P88	S89	N90	Y91	M92	N93	D94	G95	V96	C97	C100	D101	G102	T103	D104	E105	Y106	M107	G109	V110	I111	C112	E113	N114	T115	K117	GLU	LYS	GLY	ARG	LYS	GLU	ALA	ARG	GLU	LEU	LEU	GLN	GLN	GLN	GLN	GLU	GLU	
VAL	THR	ARG	GLY	PHE	ARG	LEU	LYS	LYS	ILE	LEU	GLU	ASP	TRP	LYS	LYS	ALA	ARG	GLU	GLU	GLY	LYS	LEU	ILE	LEU	GLY	LYS	LEU	LEU	GLY	VAL	GLU	GLN	VAL	GLU	GLU	GLU	GLU	ALA	GLY	GLY	LYS	PRO	PRO	GLY	GLY	ARG	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU		
GLN	HIS	GLN	LYS	LEU	TRP	GLY	GLU	GLU	GLN	ALA	ASP	GLY	GLN	LYS	LYS	ALA	ALA	GLY	GLY	LYS	LEU	ILE	LEU	GLY	LYS	LEU	LEU	LEU	VAL	LEU	VAL	GLN	GLU	GLU	GLU	GLU	GLU	GLY	GLY	LYS	PRO	PRO	GLY	GLY	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU			
ALA	GLN	ALA	LEU	LEU	SER	GLY	GLU	GLU	THR	ALA	ASP	THR	LYS	LYS	ALA	ALA	ASP	ARG	ALA	ASP	PHE	LYS	TYR	ARG	LEU	LEU	LEU	LEU	PRO	ALA	ALA	GLN	GLN	GLN	GLU	GLU	GLU	GLU	GLY	GLY	LYS	PRO	PRO	GLY	GLY	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU	LEU		
GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	GLU	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO
ALA	ARG	ASN	GLY	PHE	GLU	GLU	ALA	GLU	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY		
VAL	SER	GLN	LYS	PRO	PRO	LYS	LEU	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY

- Molecule 3: alpha-D-mannopyranose-(1-3)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain C:  50% 100%



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	180286	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 ($e^-/\text{\AA}^2$)	38.75	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	2.702	Depositor
Minimum map value	-1.690	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.045	Depositor
Recommended contour level	0.15	Depositor
Map size (Å)	374.50003, 374.50003, 374.50003	wwPDB
Map dimensions	350, 350, 350	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: BMA, CA, MAN, NAG

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	0.28	0/7159	0.54	0/9748
2	B	0.34	0/776	0.58	0/1055
All	All	0.28	0/7935	0.54	0/10803

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	6952	0	6710	123	0
2	B	758	0	672	5	0
3	C	50	0	43	0	0
4	B	2	0	0	0	0
5	A	1	0	0	0	0
All	All	7763	0	7425	127	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 8.

All (127) 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:759:ASP:HB2	1:A:762:ALA:HB2	1.64	0.77
1:A:403:TYR:HB3	1:A:408:ASP:HB3	1.68	0.75
1:A:670:GLN:O	1:A:704:ARG:NH1	2.20	0.73
1:A:158:LEU:HB2	1:A:170:VAL:HB	1.71	0.73
1:A:79:ILE:HD12	1:A:86:LEU:HB3	1.70	0.73
2:B:87:ILE:HD12	2:B:91:ARG:HB2	1.71	0.72
1:A:73:SER:HB3	1:A:92:GLN:HG3	1.71	0.72
1:A:267:ARG:HH11	1:A:741:ASN:HD21	1.41	0.68
1:A:474:ASP:HB2	1:A:477:TYR:HB2	1.77	0.66
1:A:109:ARG:HD3	1:A:181:GLN:HB3	1.78	0.64
1:A:631:PRO:HG3	1:A:743:ASP:HB2	1.78	0.64
1:A:503:TRP:HD1	1:A:504:PRO:HD3	1.62	0.63
1:A:397:HIS:HB2	1:A:674:ARG:HG3	1.81	0.63
1:A:854:TYR:HB2	1:A:860:PHE:HB3	1.81	0.61
1:A:169:SER:HB2	1:A:172:ALA:HB2	1.83	0.60
1:A:839:THR:HA	1:A:867:PHE:O	2.02	0.60
1:A:489:TYR:HA	1:A:510:PRO:HA	1.85	0.59
1:A:112:ARG:NH2	1:A:179:GLU:O	2.36	0.58
1:A:250:LEU:HD21	1:A:313:ILE:HD11	1.85	0.58
1:A:225:ALA:HB1	1:A:241:PRO:HG3	1.86	0.57
1:A:676:HIS:O	1:A:684:ARG:NH2	2.34	0.57
1:A:934:ASN:HD22	1:A:936:ALA:H	1.54	0.56
1:A:314:PHE:HB3	1:A:365:PHE:HB2	1.87	0.56
1:A:775:VAL:HG23	1:A:806:GLY:HA3	1.87	0.56
1:A:35:ARG:NH1	1:A:293:MET:SD	2.79	0.56
1:A:470:HIS:HB2	1:A:507:ALA:HB1	1.88	0.55
1:A:929:ARG:HG3	2:B:55:TYR:CE2	2.41	0.54
1:A:423:CYS:HB3	1:A:461:ARG:HE	1.71	0.54
1:A:645:GLY:HA3	1:A:672:PHE:HB3	1.89	0.54
1:A:94:LEU:HD22	1:A:123:PRO:HB2	1.89	0.54
1:A:509:TYR:OH	1:A:547:SER:O	2.24	0.53
1:A:470:HIS:HE1	1:A:543:MET:HG3	1.74	0.53
1:A:817:ARG:HG2	1:A:823:MET:HG2	1.91	0.53
1:A:903:VAL:HG11	1:A:928:LEU:HD22	1.90	0.53
1:A:263:ALA:O	1:A:290:TYR:N	2.31	0.52
1:A:299:VAL:HG12	1:A:301:VAL:HG23	1.90	0.52
1:A:320:GLU:OE1	1:A:558:LYS:NZ	2.42	0.52
1:A:473:VAL:HG21	1:A:506:SER:HB3	1.90	0.52
1:A:511:ASP:OD1	1:A:562:HIS:ND1	2.40	0.52
2:B:47:PRO:HB2	2:B:49:ASP:OD2	2.09	0.52
1:A:102:ARG:HA	1:A:362:ILE:O	2.09	0.52
1:A:383:THR:O	1:A:610:ARG:NH1	2.42	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:95:GLN:HB2	1:A:124:PRO:HB2	1.92	0.51
1:A:514:ASN:HB3	1:A:517:MET:HB3	1.93	0.51
1:A:861:LEU:HD11	1:A:936:ALA:HA	1.93	0.51
1:A:417:ASP:OD1	1:A:461:ARG:NH1	2.44	0.51
2:B:93:ASN:HD21	2:B:106:TYR:H	1.59	0.51
1:A:401:TRP:CD1	1:A:679:LEU:HG	2.46	0.50
1:A:775:VAL:HG22	1:A:836:PRO:HD3	1.94	0.50
1:A:405:ASP:N	1:A:405:ASP:OD1	2.42	0.50
1:A:714:LEU:HB3	1:A:725:VAL:HG13	1.94	0.50
1:A:503:TRP:CD1	1:A:504:PRO:HD3	2.44	0.49
1:A:545:GLU:HG3	1:A:603:ALA:HB2	1.93	0.49
1:A:769:LEU:HD13	1:A:776:TRP:HB2	1.93	0.49
1:A:393:SER:HA	1:A:397:HIS:HE1	1.78	0.49
1:A:619:ASN:O	1:A:651:PHE:N	2.44	0.48
1:A:359:THR:OG1	1:A:360:GLY:N	2.46	0.48
1:A:260:PRO:HD2	1:A:299:VAL:HB	1.94	0.48
1:A:378:GLN:O	1:A:381:SER:OG	2.27	0.48
1:A:473:VAL:HG12	1:A:480:HIS:CE1	2.49	0.48
1:A:91:LEU:HD23	1:A:101:PHE:HB3	1.96	0.47
1:A:94:LEU:HB2	1:A:98:MET:HB3	1.97	0.47
1:A:113:TYR:CZ	1:A:571:VAL:HG12	2.49	0.47
1:A:769:LEU:O	1:A:788:PRO:HA	2.15	0.47
1:A:168:LEU:HD11	1:A:366:LEU:HD13	1.96	0.46
1:A:899:LYS:HE2	1:A:917:PHE:HE2	1.81	0.46
1:A:430:ILE:HB	1:A:436:LYS:HD2	1.96	0.46
1:A:69:LEU:HG	1:A:74:LEU:HD12	1.98	0.46
1:A:110:ARG:HB3	1:A:181:GLN:HE21	1.81	0.46
1:A:644:CYS:SG	1:A:645:GLY:N	2.89	0.46
1:A:752:LEU:HA	1:A:803:PHE:O	2.16	0.46
1:A:234:SER:HB3	1:A:493:ARG:HH12	1.81	0.46
1:A:488:LEU:HB3	1:A:517:MET:HB2	1.97	0.46
1:A:501:TRP:O	1:A:549:PHE:HB3	2.15	0.46
1:A:110:ARG:HH21	1:A:242:MET:HE1	1.81	0.46
1:A:498:TYR:CE2	1:A:556:MET:HG3	2.51	0.45
1:A:470:HIS:CE1	1:A:543:MET:HG3	2.51	0.45
1:A:715:LEU:HD22	1:A:725:VAL:HG21	1.98	0.45
1:A:60:TYR:CZ	1:A:80:HIS:HD2	2.35	0.45
1:A:615:TRP:NE1	1:A:617:GLY:O	2.50	0.45
1:A:67:LEU:HD11	1:A:74:LEU:HD11	1.99	0.45
1:A:479:VAL:HG13	1:A:520:TRP:HH2	1.82	0.45
1:A:546:PRO:HG3	1:A:556:MET:HE3	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:289:LEU:HD22	1:A:628:ILE:HG21	1.99	0.44
1:A:820:SER:HA	1:A:823:MET:HB2	1.98	0.44
1:A:36:SER:O	1:A:36:SER:OG	2.31	0.44
1:A:176:LEU:HD13	1:A:246:LEU:HD13	1.99	0.44
1:A:430:ILE:HD12	1:A:436:LYS:HE2	1.99	0.44
1:A:372:ILE:HG21	1:A:731:VAL:HG22	2.00	0.43
1:A:383:THR:O	1:A:610:ARG:HD3	2.18	0.43
1:A:253:MET:SD	1:A:306:ASN:HB2	2.58	0.43
1:A:695:ASP:OD1	1:A:698:ARG:NH1	2.51	0.43
1:A:48:LYS:HB2	1:A:48:LYS:HE2	1.83	0.43
1:A:460:ARG:HH12	1:A:822:CYS:HB2	1.84	0.43
1:A:547:SER:O	1:A:547:SER:OG	2.35	0.43
1:A:552:PRO:HG2	1:A:557:LEU:HA	2.00	0.43
1:A:793:LEU:HD13	1:A:801:PRO:HB3	2.01	0.42
1:A:892:VAL:HB	1:A:928:LEU:HB2	2.00	0.42
1:A:813:TRP:CH2	1:A:824:LYS:HA	2.54	0.42
1:A:904:VAL:HG21	1:A:944:ARG:NH1	2.35	0.42
1:A:158:LEU:HD23	1:A:158:LEU:HA	1.89	0.42
1:A:403:TYR:HD2	1:A:428:LEU:HD23	1.84	0.42
1:A:751:ALA:HA	1:A:808:THR:HG21	2.01	0.42
1:A:86:LEU:HD23	1:A:86:LEU:H	1.85	0.42
1:A:276:PRO:HG2	1:A:322:TRP:CE3	2.54	0.42
1:A:502:CYS:HB3	1:A:504:PRO:HD2	2.02	0.42
1:A:60:TYR:HA	1:A:79:ILE:O	2.20	0.42
1:A:276:PRO:HG2	1:A:322:TRP:HE3	1.85	0.42
1:A:473:VAL:HG22	1:A:506:SER:O	2.20	0.42
1:A:494:ASP:OD1	1:A:495:GLY:N	2.52	0.42
1:A:305:HIS:ND1	1:A:372:ILE:HD11	2.35	0.41
1:A:160:LEU:HD22	1:A:368:LEU:HD21	2.03	0.41
1:A:134:ASP:HB3	1:A:137:SER:H	1.85	0.41
1:A:432:HIS:CE1	1:A:465:ALA:HB1	2.55	0.41
1:A:371:SER:O	1:A:375:VAL:HG13	2.21	0.41
1:A:510:PRO:O	1:A:575:TYR:OH	2.25	0.41
1:A:156:PHE:HD2	1:A:171:ASN:HD22	1.69	0.41
2:B:79:ASN:HB3	2:B:116:CYS:SG	2.60	0.41
1:A:58:SER:HB2	1:A:174:GLY:HA2	2.03	0.41
1:A:90:GLU:O	1:A:101:PHE:HA	2.19	0.41
1:A:705:TYR:O	1:A:708:LEU:HB2	2.20	0.41
1:A:616:THR:HB	1:A:632:MET:HE2	2.03	0.41
1:A:628:ILE:O	1:A:632:MET:HG3	2.21	0.41
1:A:779:ILE:HD13	1:A:779:ILE:HA	1.89	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:123:PRO:HA	1:A:124:PRO:HD3	1.98	0.40
1:A:470:HIS:HD2	1:A:504:PRO:HG2	1.86	0.40
1:A:660:LEU:HD23	1:A:689:LEU:HD21	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	856/944 (91%)	799 (93%)	57 (7%)	0	100	100
2	B	98/528 (19%)	93 (95%)	5 (5%)	0	100	100
All	All	954/1472 (65%)	892 (94%)	62 (6%)	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	751/810 (93%)	694 (92%)	57 (8%)	11	30
2	B	88/461 (19%)	85 (97%)	3 (3%)	32	64
All	All	839/1271 (66%)	779 (93%)	60 (7%)	14	32

All (60) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	48	LYS
1	A	61	ARG
1	A	74	LEU
1	A	87	LEU
1	A	95	GLN
1	A	137	SER
1	A	139	GLU
1	A	141	THR
1	A	159	ASP
1	A	163	ASP
1	A	166	LEU
1	A	169	SER
1	A	182	ARG
1	A	232	THR
1	A	275	GLU
1	A	298	SER
1	A	310	ASP
1	A	311	LEU
1	A	352	ASP
1	A	394	LEU
1	A	424	ASP
1	A	432	HIS
1	A	444	SER
1	A	452	MET
1	A	460	ARG
1	A	477	TYR
1	A	496	SER
1	A	503	TRP
1	A	530	TYR
1	A	541	ASN
1	A	559	ASP
1	A	569	ARG
1	A	589	GLN
1	A	608	SER
1	A	615	TRP
1	A	635	SER
1	A	643	PHE
1	A	683	ARG
1	A	687	TRP
1	A	691	SER
1	A	699	ASP
1	A	732	GLN
1	A	779	ILE

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Continued from previous page...

Mol	Chain	Res	Type
1	A	781	SER
1	A	791	LEU
1	A	814	MET
1	A	821	GLU
1	A	829	THR
1	A	866	SER
1	A	875	SER
1	A	878	ASP
1	A	894	ILE
1	A	900	PRO
1	A	907	THR
1	A	908	LYS
1	A	930	LYS
1	A	935	VAL
2	B	54	ASP
2	B	72	ASN
2	B	100	CYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	77	HIS
1	A	286	GLN
1	A	308	HIS
1	A	397	HIS
1	A	470	HIS
1	A	529	ASN
1	A	741	ASN
1	A	783	GLN
1	A	785	HIS
1	A	934	ASN
1	A	942	HIS
2	B	27	ASN
2	B	29	HIS
2	B	93	ASN

5.3.3 RNA

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](#)

4 monosaccharides are modelled in this entry.

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
3	NAG	C	1	1,3	14,14,15	0.40	0	17,19,21	0.70	0
3	NAG	C	2	3	14,14,15	0.33	0	17,19,21	0.51	0
3	BMA	C	3	3	11,11,12	0.22	0	15,15,17	0.47	0
3	MAN	C	4	3	11,11,12	0.21	0	15,15,17	0.50	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
3	NAG	C	1	1,3	-	2/6/23/26	0/1/1/1
3	NAG	C	2	3	-	0/6/23/26	0/1/1/1
3	BMA	C	3	3	-	0/2/19/22	0/1/1/1
3	MAN	C	4	3	-	1/2/19/22	1/1/1/1

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (3) torsion outliers are listed below:

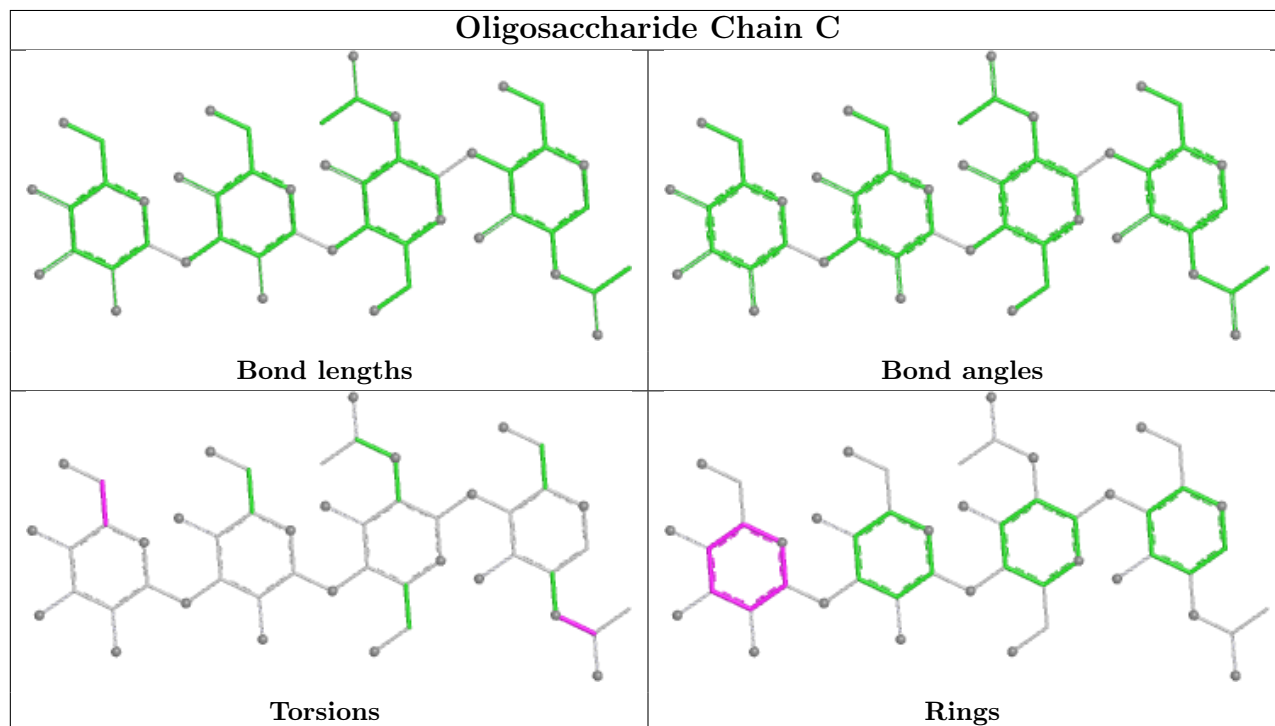
Mol	Chain	Res	Type	Atoms
3	C	4	MAN	O5-C5-C6-O6
3	C	1	NAG	C8-C7-N2-C2
3	C	1	NAG	O7-C7-N2-C2

All (1) ring outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	4	MAN	C1-C2-C3-C4-C5-O5

No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.



5.6 Ligand geometry [i](#)

Of 2 ligands modelled in this entry, 2 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

There are no chain breaks in this entry.

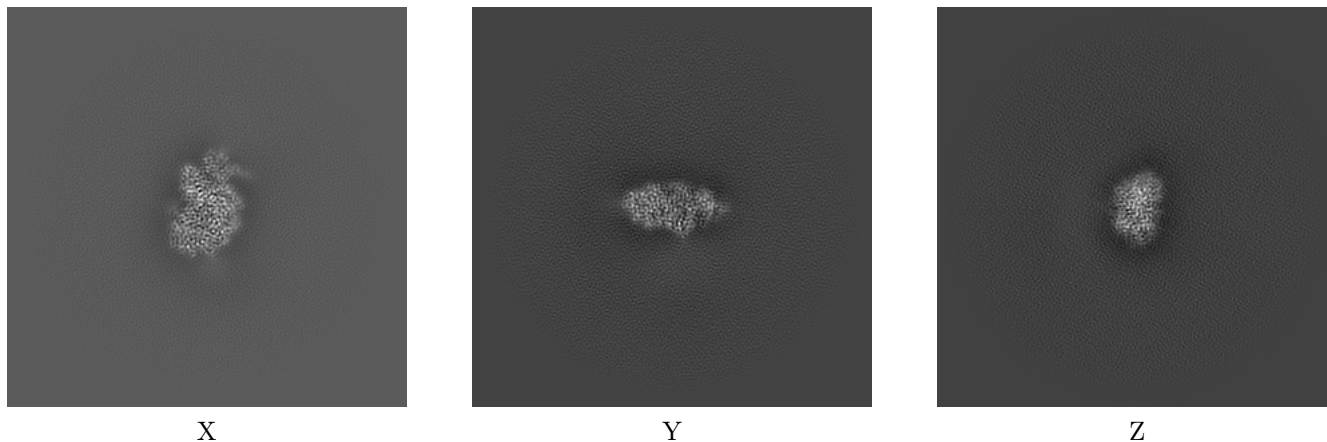
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-27173. These allow visual inspection of the internal detail of the map and identification of artifacts.

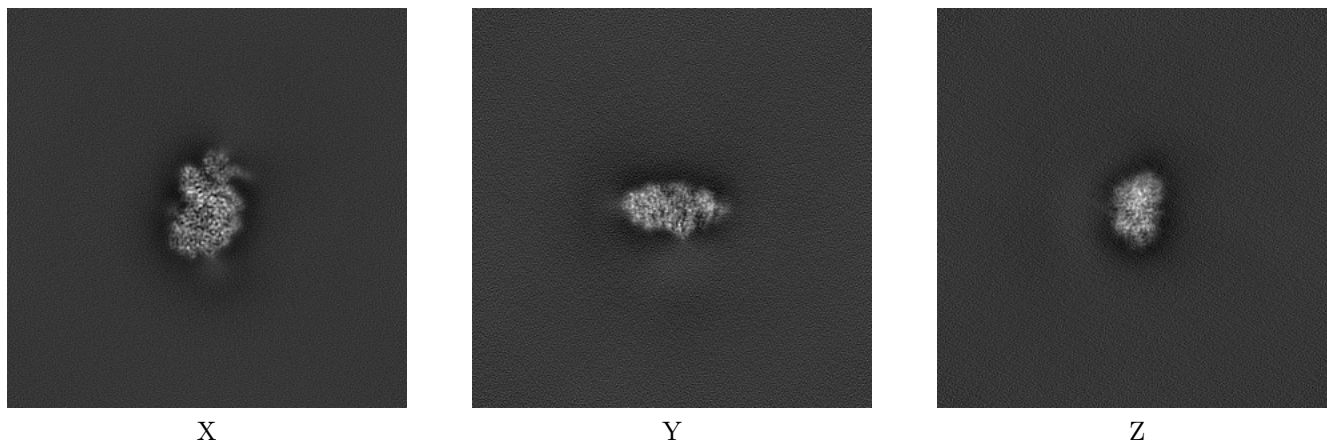
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

6.1.1 Primary map



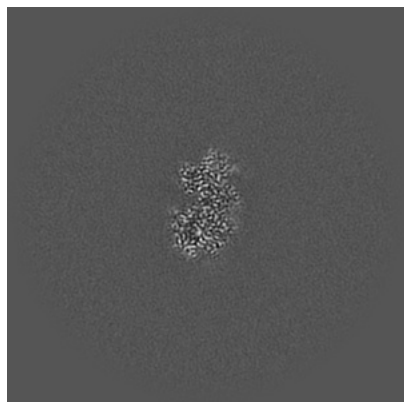
6.1.2 Raw map



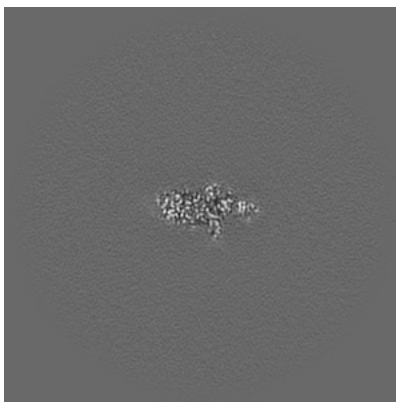
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

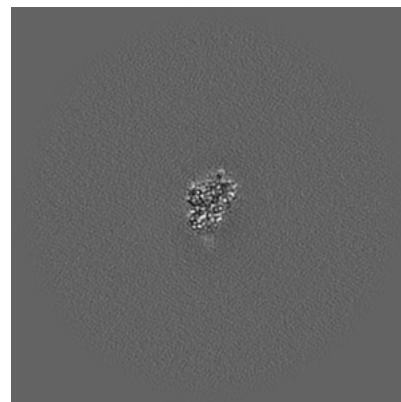
6.2.1 Primary map



X Index: 175

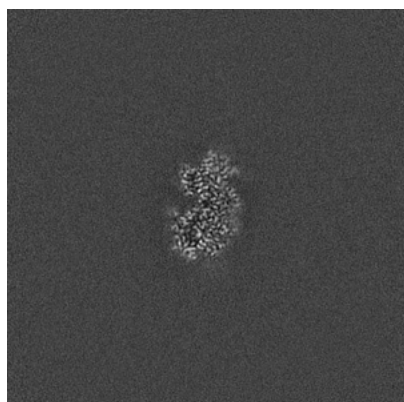


Y Index: 175

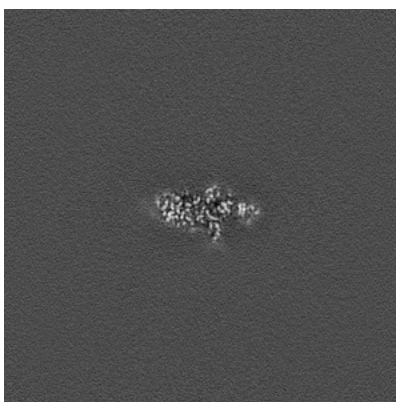


Z Index: 175

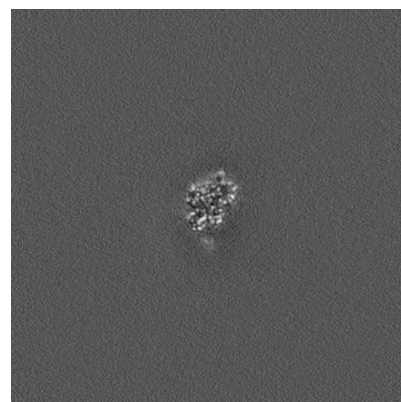
6.2.2 Raw map



X Index: 175



Y Index: 175

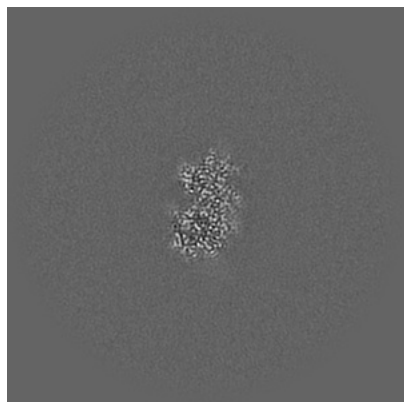


Z Index: 175

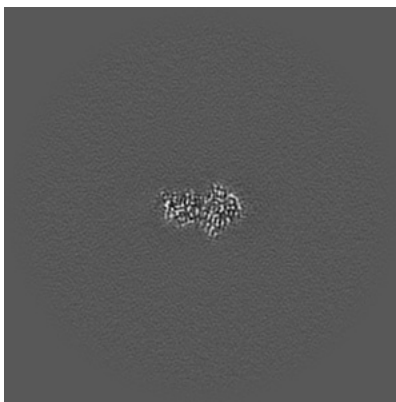
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

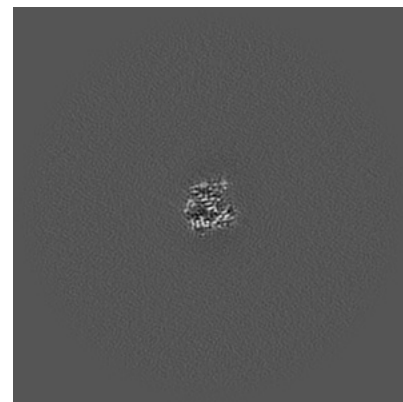
6.3.1 Primary map



X Index: 176

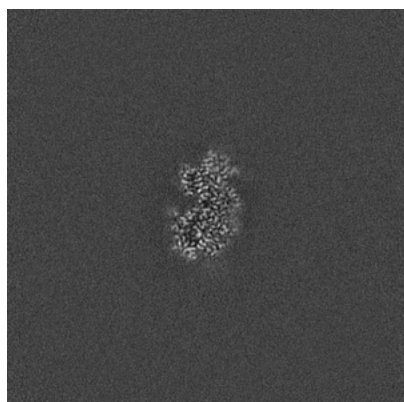


Y Index: 167

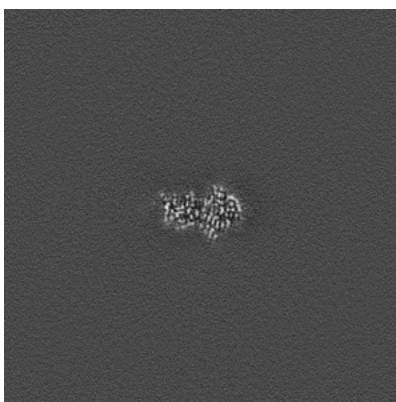


Z Index: 188

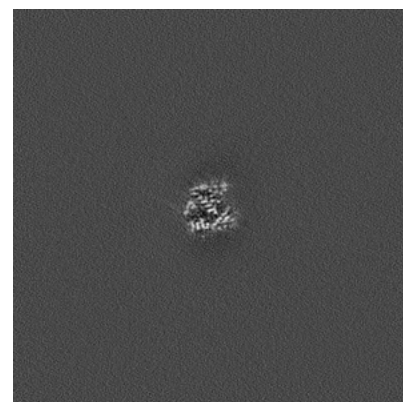
6.3.2 Raw map



X Index: 175



Y Index: 167

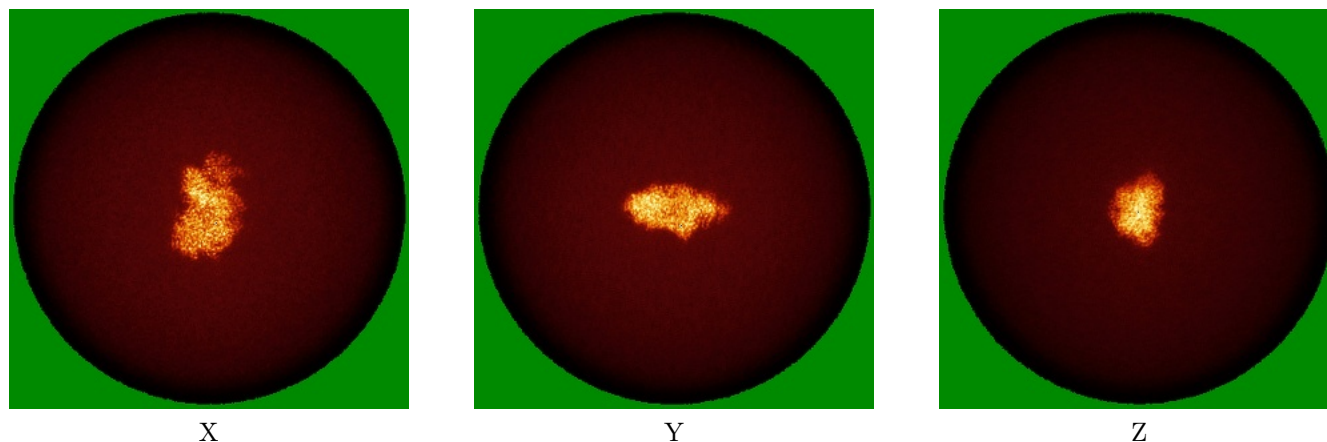


Z Index: 188

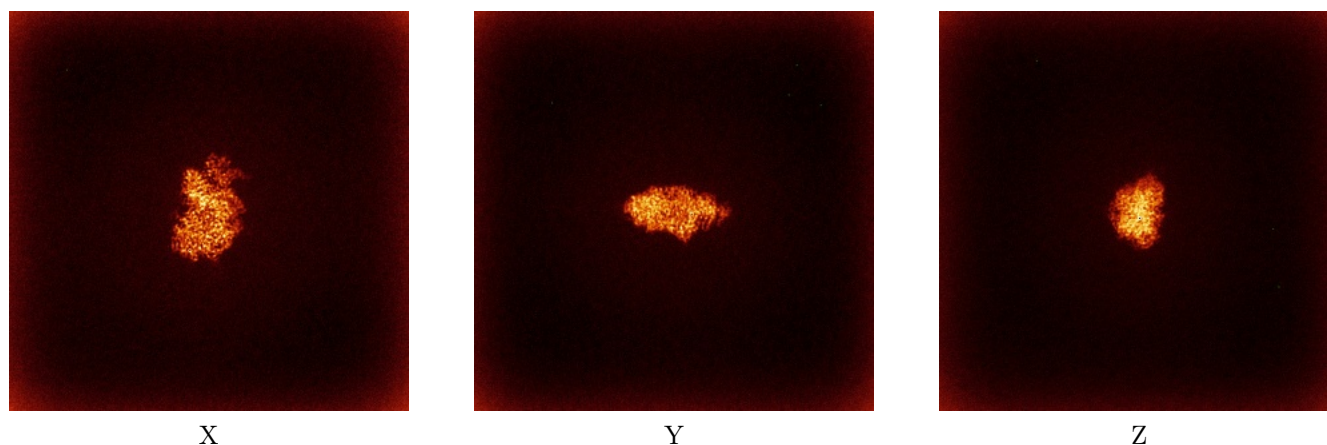
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map



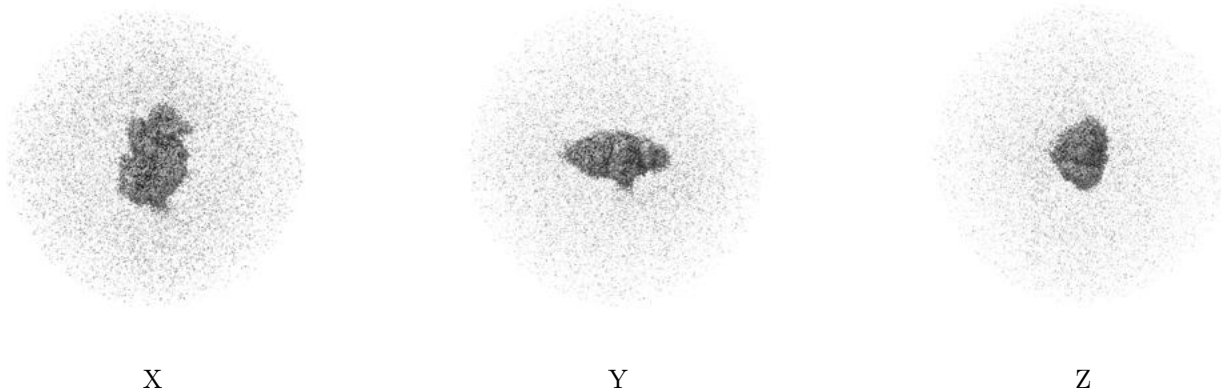
6.4.2 Raw map



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.

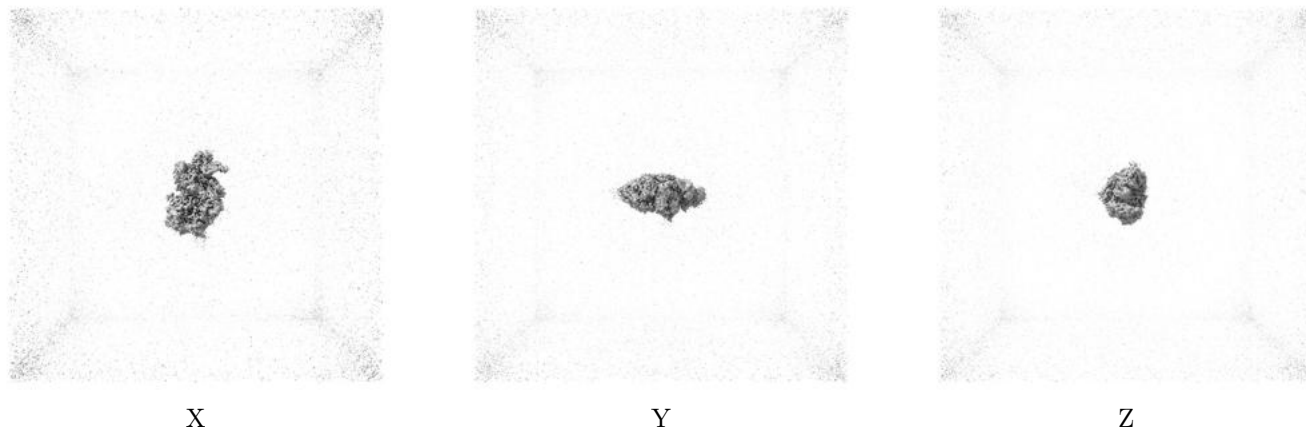
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.15. 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



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.

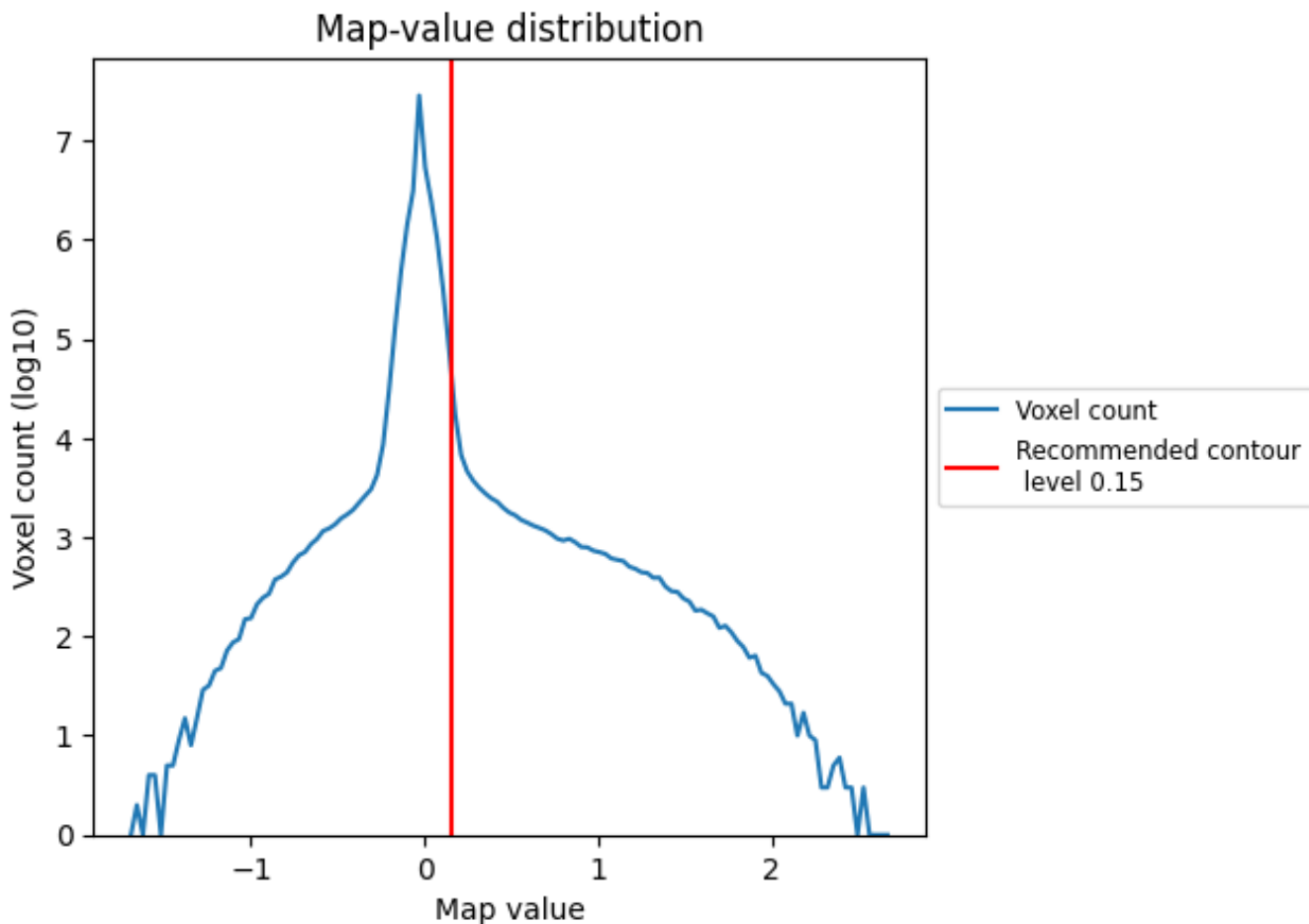
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

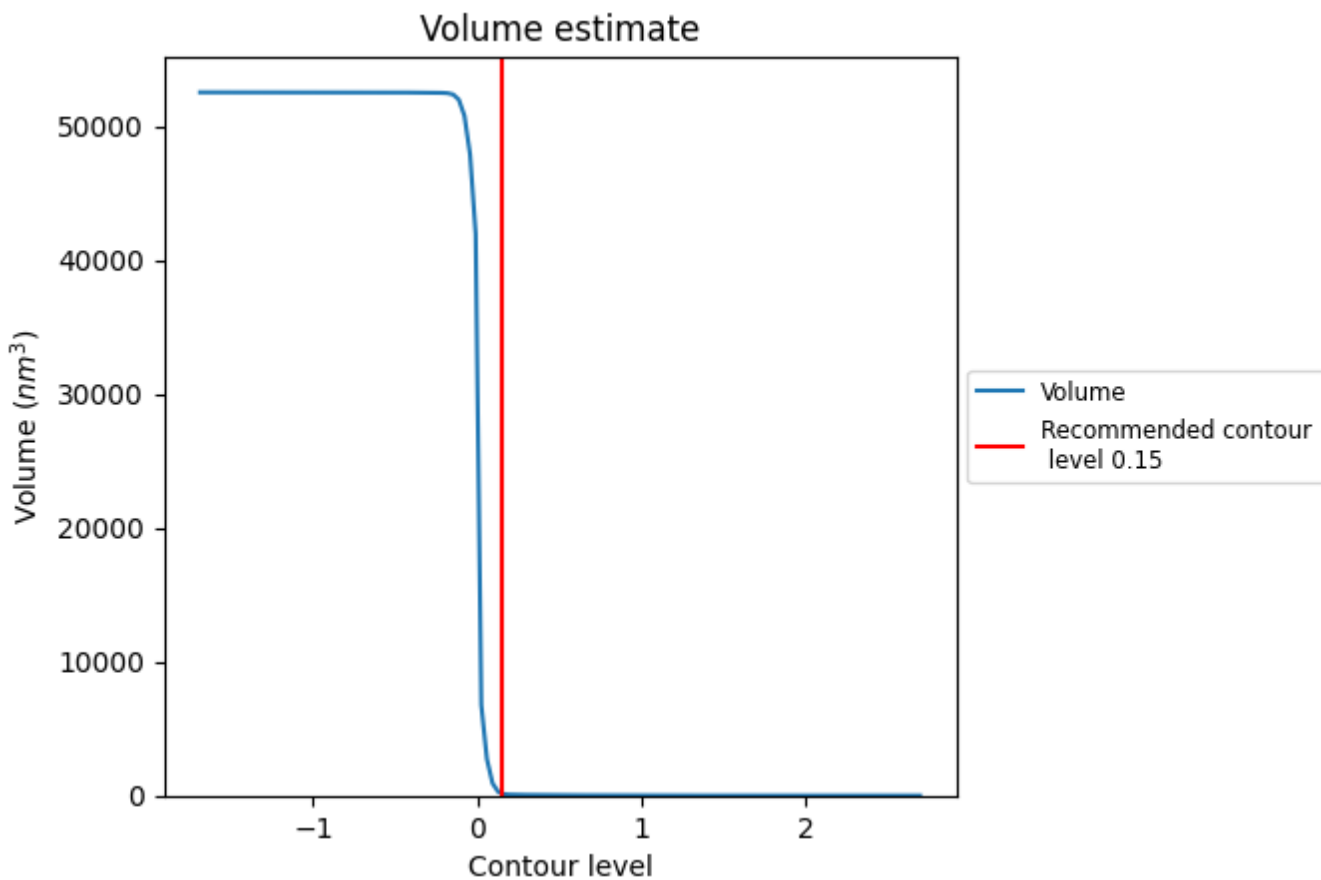
This section contains the results of statistical analysis of the map.

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.

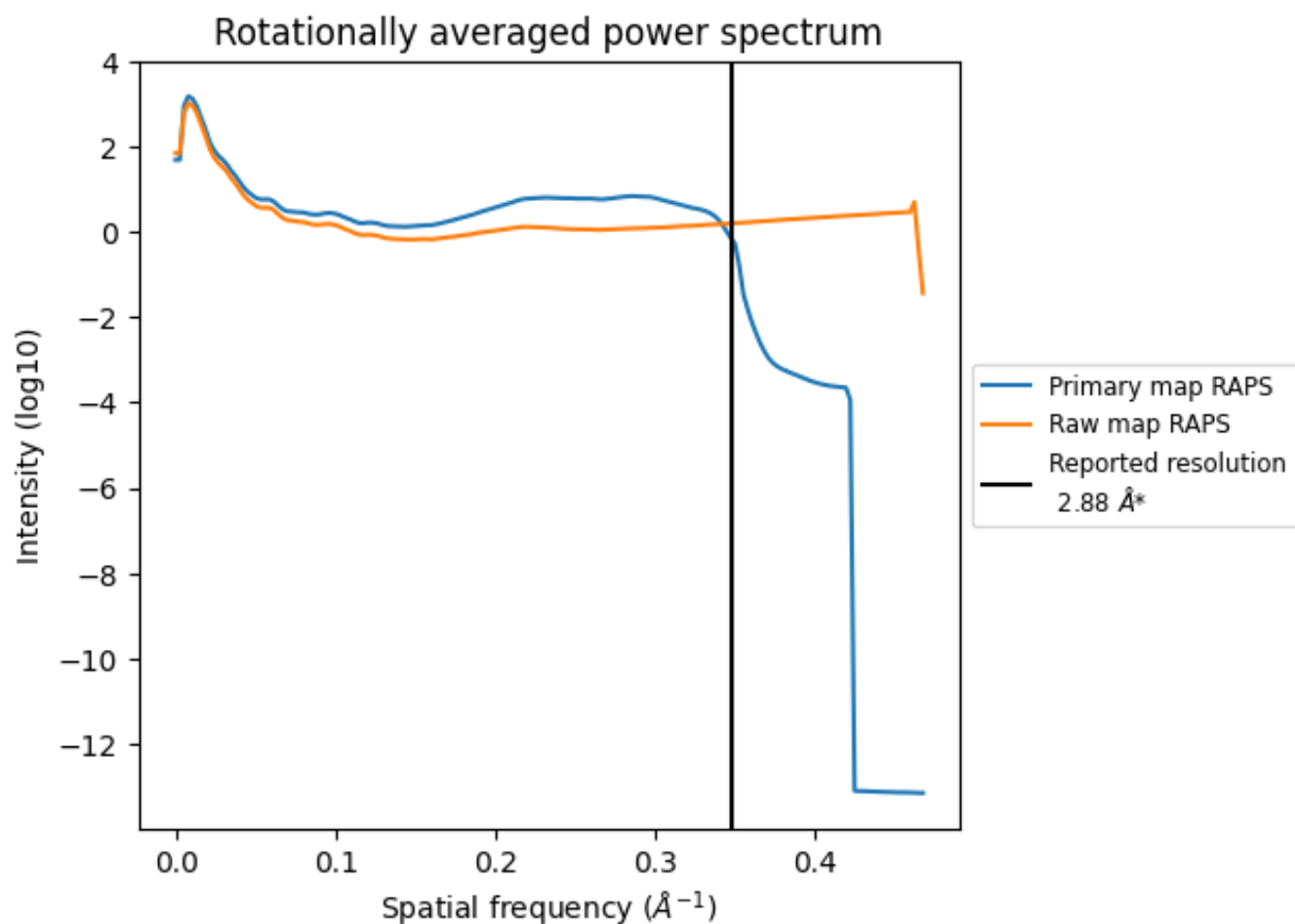
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 173 nm³; this corresponds to an approximate mass of 157 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](#)

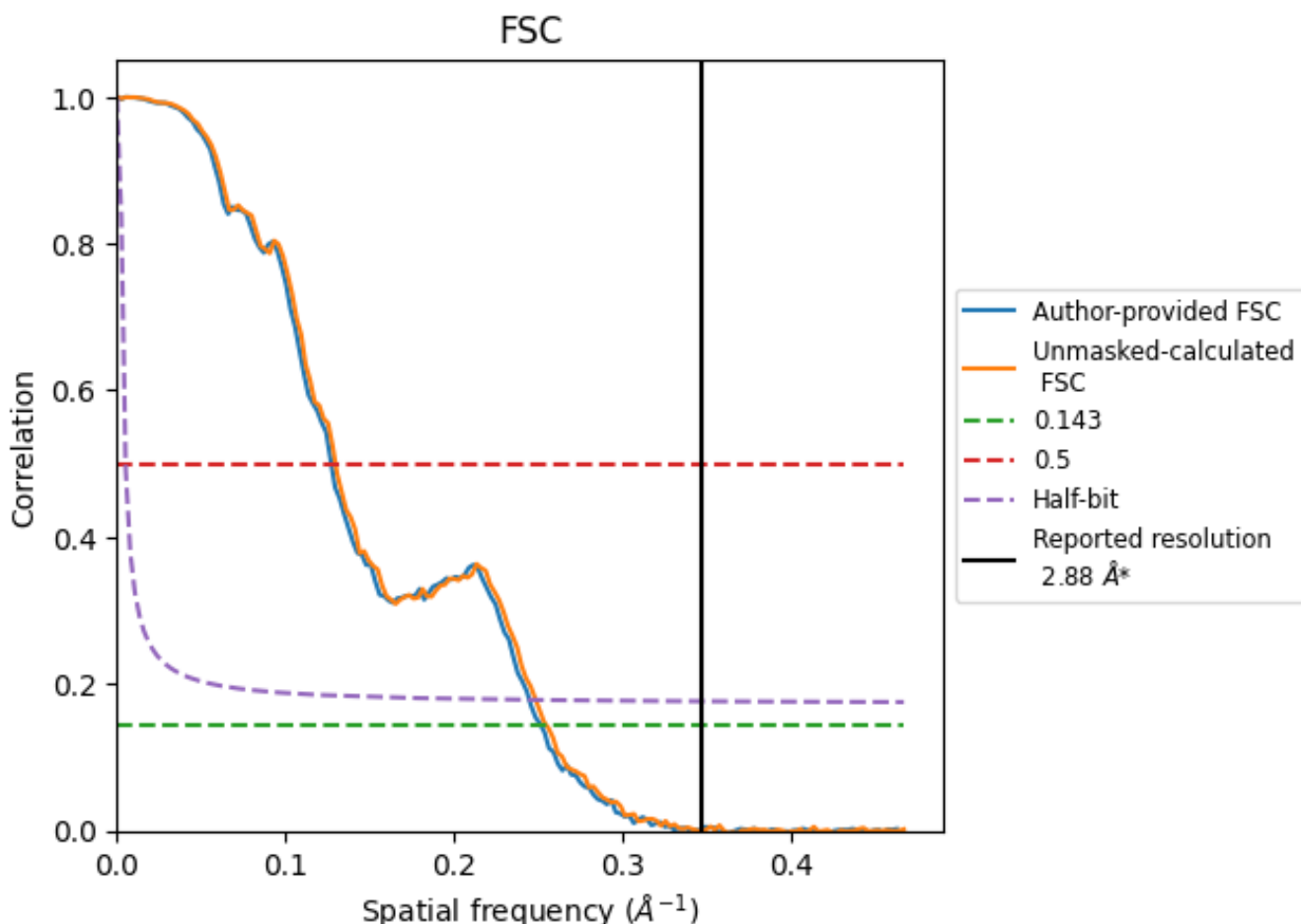


*Reported resolution corresponds to spatial frequency of 0.347 Å⁻¹

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 0.347 \AA^{-1}

8.2 Resolution estimates [i](#)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.88	-	-
Author-provided FSC curve	3.97	7.86	4.08
Unmasked-calculated*	3.92	7.70	4.02

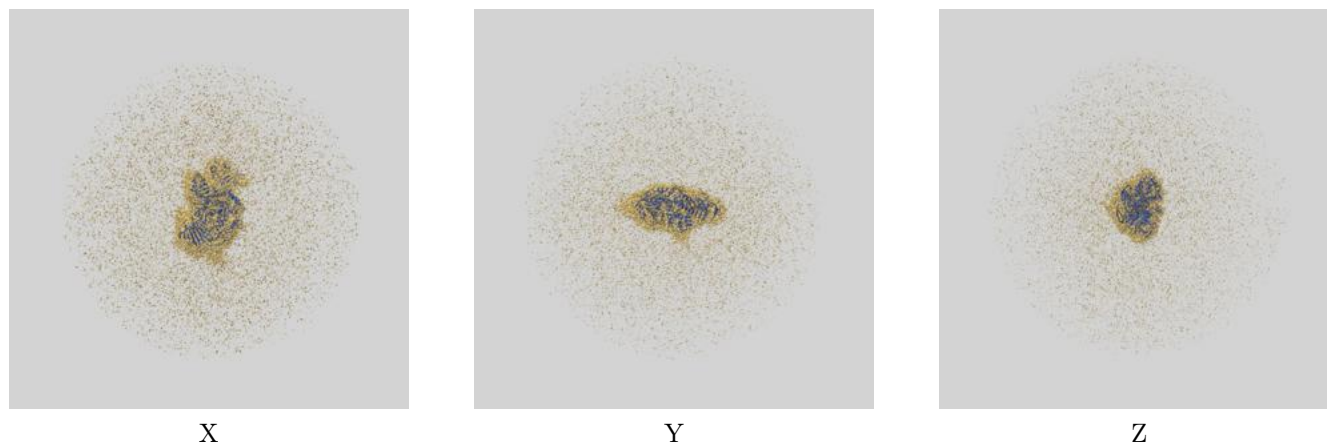
*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from author-provided FSC intersecting FSC 0.143 CUT-OFF 3.97 differs from the reported value 2.88 by more than 10 %

The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.92 differs from the reported value 2.88 by more than 10 %

9 Map-model fit [i](#)

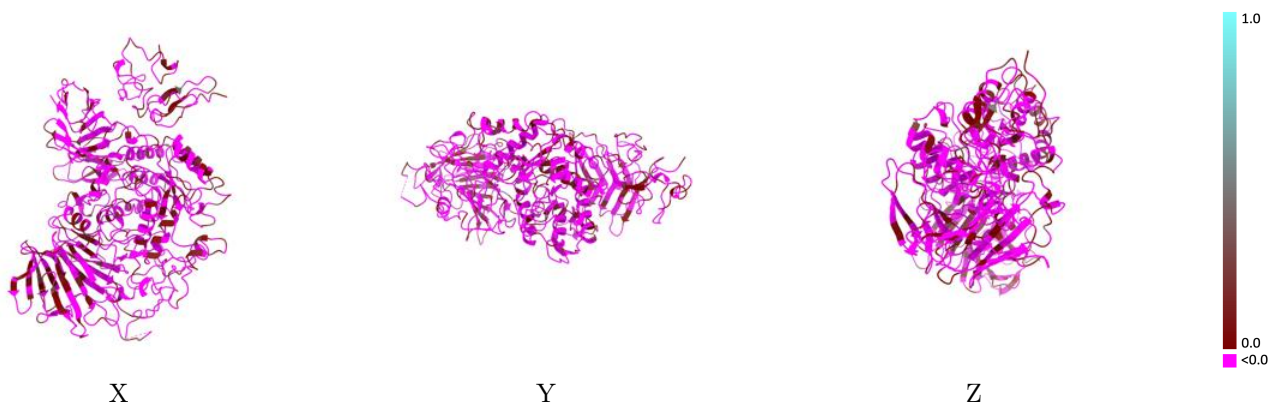
This section contains information regarding the fit between EMDB map EMD-27173 and PDB model 8D43. Per-residue inclusion information can be found in section [3](#) on page [4](#).

9.1 Map-model overlay [i](#)



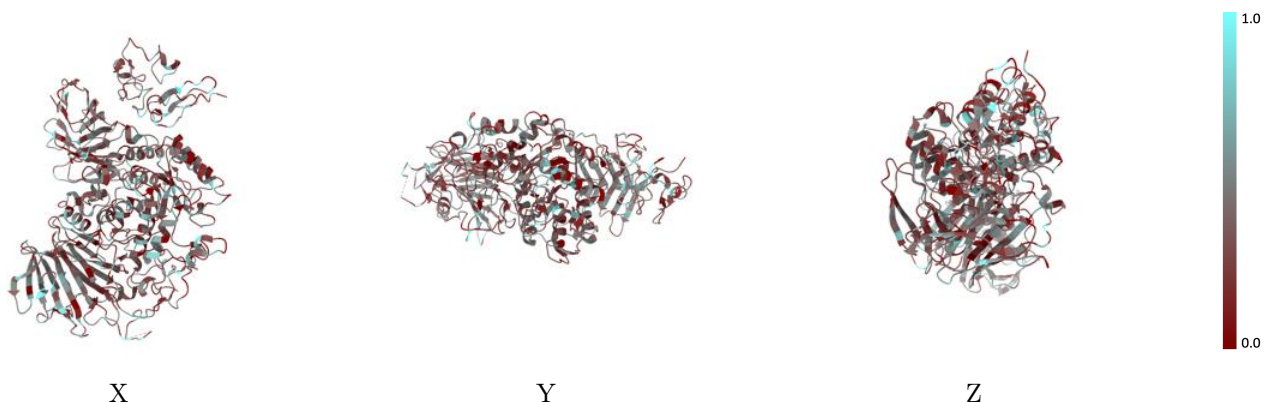
The images above show the 3D surface view of the map at the recommended contour level 0.15 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



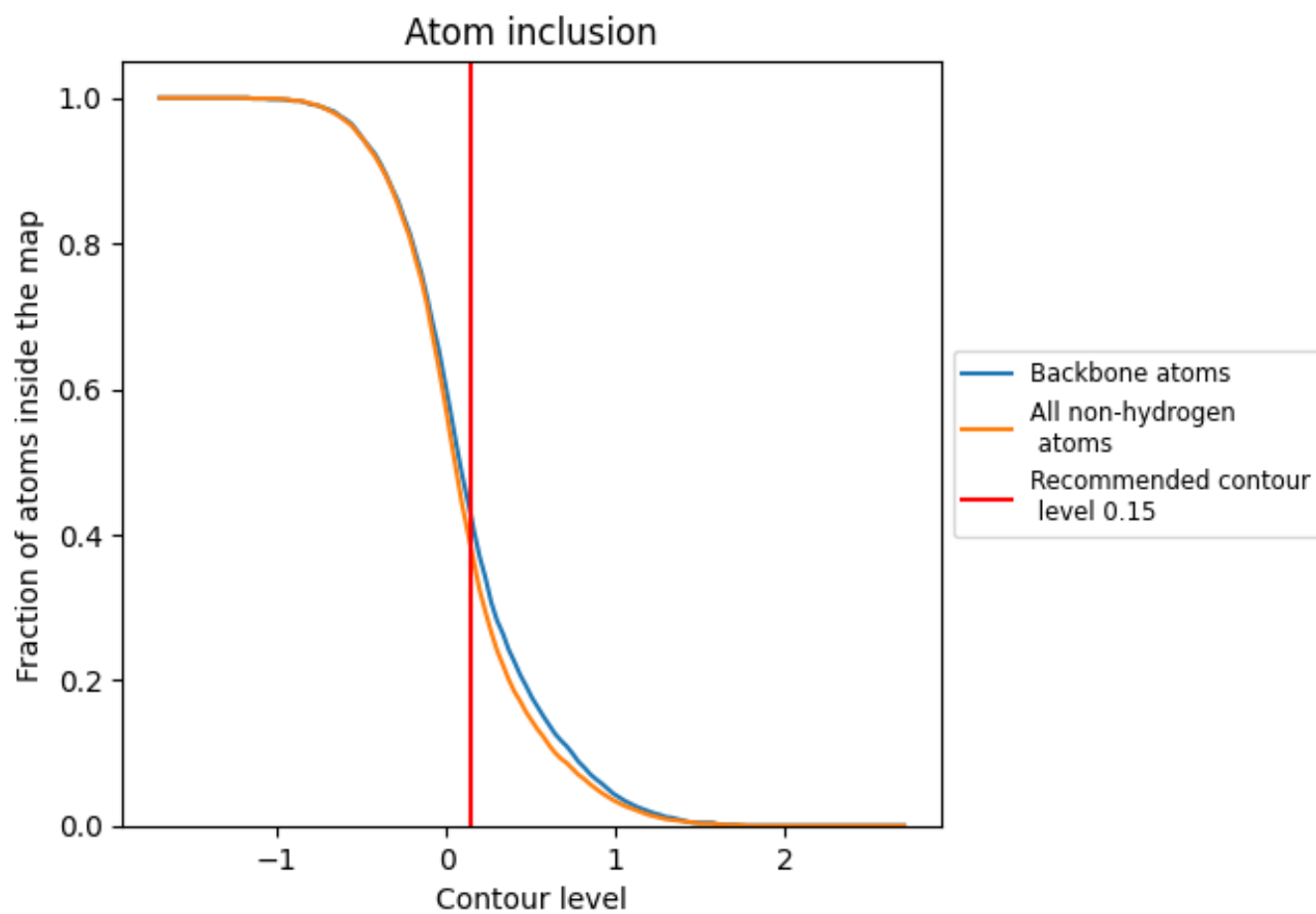
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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, 42% of all backbone atoms, 38% 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	 0.3770	 -0.0950
A	 0.3750	 -0.1000
B	 0.4030	 -0.0580
C	 0.3600	 -0.0170

