WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

May 21, 2023 – 12:16 AM JST

PDB ID	:	8HDK
EMDB ID	:	EMD-34674
Title	:	Structure of the Rat GluN1-GluN2C NMDA receptor in complex with glycine and glutamate (minor class in symmetry)
Authors	:	Zhang, M.; Zhang, J.; Guo, F.; Li, Y.; Zhu, S.
Deposited on	:	2022-11-04
Resolution	:	4.30 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 (i) 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 (i)) were used in the production of this report:

EMDB validation analysis	:	0.0.1.dev50
Mogul	:	1.8.5 (274361), CSD as541be (2020)
MolProbity	:	4.02b-467
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
MapQ	:	1.9.9
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.32.2

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
ELECTRON MICROSCOPY

The reported resolution of this entry is 4.30 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.
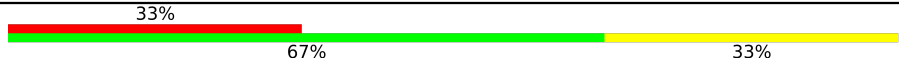
Metric	Percentile Ranks	Value
Ramachandran outliers		0.3%
Sidechain outliers		0.5%

Worse   *Better*

▊ Percentile relative to all structures
▯ Percentile relative to all EM structures
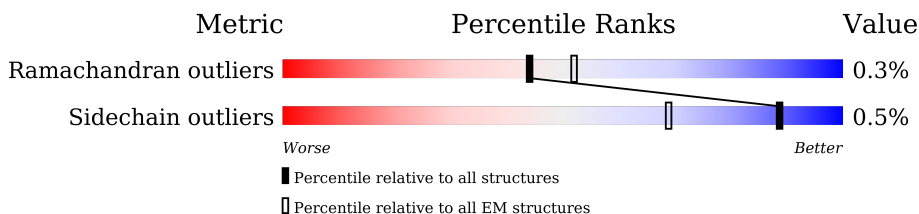
Metric	Whole archive (#Entries)	EM structures (#Entries)
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=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 <=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	796	82% 18%
1	C	796	82% 18%
2	B	800	80% 19%
2	D	800	80% 19%
3	E	2	100%
3	G	2	100%
3	V	2	100%
3	X	2	100%
3	g	2	50% / 50% 50%

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Mol	Chain	Length	Quality of chain
4	N	3	33% / 67% / 33%
4	R	3	33% / 67% / 33%
4	c	3	33% / 33% / 67%

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 20884 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 Glutamate receptor ionotropic, NMDA 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	654	Total	C	N	O	S	0	0
			5194	3281	915	970	28		
1	C	656	Total	C	N	O	S	0	0
			5216	3295	918	975	28		

- Molecule 2 is a protein called Glutamate receptor ionotropic, NMDA 2C.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	649	Total	C	N	O	S	0	0
			5023	3202	880	920	21		
2	D	649	Total	C	N	O	S	0	0
			5026	3203	881	921	21		

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

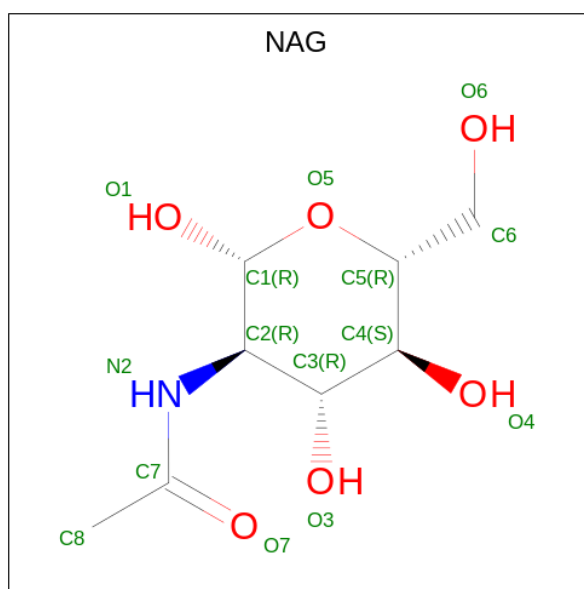| Mol	Chain	Residues	Atoms				AltConf	Trace
3	E	2	Total	C	N	O	0	0
			28	16	2	10		
3	G	2	Total	C	N	O	0	0
			28	16	2	10		
3	V	2	Total	C	N	O	0	0
			28	16	2	10		
3	X	2	Total	C	N	O	0	0
			28	16	2	10		
3	g	2	Total	C	N	O	0	0
			28	16	2	10		

- Molecule 4 is an oligosaccharide called alpha-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
4	N	3	Total	C	N	O	0	0
			39	22	2	15		
4	R	3	Total	C	N	O	0	0
			39	22	2	15		
4	c	3	Total	C	N	O	0	0
			39	22	2	15		

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: $C_8H_{15}NO_6$).

Mol	Chain	Residues	Atoms				AltConf
5	A	1	Total	C	N	O	0
			14	8	1	5	
5	A	1	Total	C	N	O	0
			14	8	1	5	
5	A	1	Total	C	N	O	0
			14	8	1	5	
5	A	1	Total	C	N	O	0
			14	8	1	5	
5	A	1	Total	C	N	O	0
			14	8	1	5	

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Mol	Chain	Residues	Atoms				AltConf
5	B	1	Total 14	C 8	N 1	O 5	0
5	C	1	Total 14	C 8	N 1	O 5	0
5	C	1	Total 14	C 8	N 1	O 5	0
5	C	1	Total 14	C 8	N 1	O 5	0
5	C	1	Total 14	C 8	N 1	O 5	0
5	C	1	Total 14	C 8	N 1	O 5	0
5	D	1	Total 14	C 8	N 1	O 5	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: Glutamate receptor ionotropic, NMDA 1

Chain A:

• Molecule 1: Glutamate receptor ionotropic, NMDA 1

Chain C:

• Molecule 2: Glutamate receptor ionotropic, NMDA 2C

Chain B:

VAL PRO ILE GLU ASN PRO ARG GLY THR THR SER LYS ILE MET VAL LEU VAL TRP ALA PHE PHE ALA VAL ILE PHE LEU ALA SER TYR THR ALA ASN LEU ALA ALA PHE MET ILE GLU GLN GLN TYR ILE ASP THR VAL **S661** Y675 R679 I748 Q799 ASN

• Molecule 2: Glutamate receptor ionotropic, NMDA 2C

Chain D:

MET GLY GLY ALA LEU GLY PRO ALA LEU LEU LEU THR SER LEU LEU GLY ALA TRP ALA ARG LEU GLY ALA GLY GLN GLU GLN A29 D187 L196 R211 R286 R318 H377 R411 H439 L446 K455 R537 SER ASN GLY THR VAL SER PRO SER ALA

PHE LEU GLU PRO TYR SER PRO ALA VAL TRP VAL MET MET PHE VAL MET CYS LEU THR VAL ALA ILE THR PHE MET PHE GLU TYR PHE SER PRO VAL SER TYR ASN GLN ASN LEU THR LYS GLY LYS LYS PRO GLY GLY PRO SER PHE THR ILE GLY LYS SER VAL TRP LEU LEU

TRP ALA LEU VAL PHE ASN ASN SER VAL PRO ILE GLU ASN PRO ARG GLY THR THR SER LYS ILE MET VAL LEU VAL TRP ALA PHE PHE ALA VAL ILE PHE LEU ALA SER TYR THR ALA ASN LEU ALA ALA PHE MET ILE GLN GLU GLN TYR ILE ASP THR VAL **S661** Y675 N800

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

Chain E:

NAG1 NAG2

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

Chain G:

NAG1 NAG2

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

Chain V:

NAG1 NAG2

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

Chain X:

NAG1 NAG2

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

Chain g:

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

Chain N:

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

Chain R:

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

Chain c:

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, POINT, POINT, POINT	Depositor
Number of particles used	15479, 15479, 15479, 15479	Depositor
Resolution determination method	FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION, PHASE FLIPPING AND AMPLITUDE CORRECTION, PHASE FLIPPING AND AMPLITUDE CORRECTION, PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose $(e^-/\text{Å}^2)$	60, 60	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	DIRECT ELECTRON DE-10 (5k x 4k), DIRECT ELECTRON DE-10 (5k x 4k)	Depositor
Maximum map value	0.991	Depositor
Minimum map value	-0.372	Depositor
Average map value	0.007	Depositor
Map value standard deviation	0.049	Depositor
Recommended contour level	0.246	Depositor
Map size (Å)	310.59, 310.59, 310.59	wwPDB
Map dimensions	290, 290, 290	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.071, 1.071, 1.071	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: 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	0.26	0/5306	0.52	0/7181
1	C	0.26	0/5329	0.52	0/7211
2	B	0.26	0/5141	0.54	0/6994
2	D	0.26	0/5144	0.53	0/6997
All	All	0.26	0/20920	0.53	0/28383

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)

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

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	650/796 (82%)	610 (94%)	39 (6%)	1 (0%)	47	81

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	C	652/796 (82%)	618 (95%)	33 (5%)	1 (0%)	47	81
2	B	645/800 (81%)	601 (93%)	42 (6%)	2 (0%)	41	76
2	D	645/800 (81%)	600 (93%)	42 (6%)	3 (0%)	29	68
All	All	2592/3192 (81%)	2429 (94%)	156 (6%)	7 (0%)	44	76

All (7) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	D	411	ARG
2	B	748	ILE
2	B	675	TYR
2	D	675	TYR
1	A	299	GLU
1	C	491	ASN
2	D	377	HIS

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	571/690 (83%)	570 (100%)	1 (0%)	93	96
1	C	573/690 (83%)	570 (100%)	3 (0%)	88	93
2	B	546/669 (82%)	543 (100%)	3 (0%)	88	93
2	D	546/669 (82%)	542 (99%)	4 (1%)	84	90
All	All	2236/2718 (82%)	2225 (100%)	11 (0%)	89	93

All (11) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	174	ARG
2	B	343	ARG
2	B	355	ARG
2	B	679	ARG

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Mol	Chain	Res	Type
1	C	174	ARG
1	C	678	LYS
1	C	794	ARG
2	D	211	ARG
2	D	286	ARG
2	D	318	ARG
2	D	455	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
2	B	669	GLN
1	C	28	ASN
1	C	50	ASN
1	C	94	HIS
1	C	171	HIS
1	C	521	ASN
2	D	114	GLN
2	D	695	ASN

5.3.3　RNA ⓘ

There are no RNA molecules in this entry.

5.4　Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5　Carbohydrates ⓘ

19 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	E	1	3,1	14,14,15	0.26	0	17,19,21	0.38	0
3	NAG	E	2	3	14,14,15	0.26	0	17,19,21	0.40	0
3	NAG	G	1	3,1	14,14,15	0.21	0	17,19,21	0.43	0
3	NAG	G	2	3	14,14,15	0.22	0	17,19,21	0.44	0
4	NAG	N	1	4,1	14,14,15	0.33	0	17,19,21	0.41	0
4	NAG	N	2	4	14,14,15	0.20	0	17,19,21	0.40	0
4	MAN	N	3	4	11,11,12	0.67	0	15,15,17	1.03	2 (13%)
4	NAG	R	1	2,4	14,14,15	0.25	0	17,19,21	0.40	0
4	NAG	R	2	4	14,14,15	0.15	0	17,19,21	0.46	0
4	MAN	R	3	4	11,11,12	0.68	0	15,15,17	1.02	2 (13%)
3	NAG	V	1	3	14,14,15	0.47	0	17,19,21	1.23	2 (11%)
3	NAG	V	2	3	14,14,15	0.41	0	17,19,21	0.88	1 (5%)
3	NAG	X	1	3,1	14,14,15	0.26	0	17,19,21	0.48	0
3	NAG	X	2	3	14,14,15	0.23	0	17,19,21	0.42	0
4	NAG	c	1	4	14,14,15	0.49	0	17,19,21	1.18	2 (11%)
4	NAG	c	2	4	14,14,15	0.44	0	17,19,21	1.02	2 (11%)
4	MAN	c	3	4	11,11,12	0.29	0	15,15,17	0.80	0
3	NAG	g	1	3	14,14,15	0.45	0	17,19,21	1.29	3 (17%)
3	NAG	g	2	3	14,14,15	0.46	0	17,19,21	0.70	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	E	1	3,1	-	0/6/23/26	0/1/1/1
3	NAG	E	2	3	-	1/6/23/26	0/1/1/1
3	NAG	G	1	3,1	-	2/6/23/26	0/1/1/1
3	NAG	G	2	3	-	2/6/23/26	0/1/1/1
4	NAG	N	1	4,1	-	3/6/23/26	0/1/1/1
4	NAG	N	2	4	-	1/6/23/26	0/1/1/1
4	MAN	N	3	4	-	0/2/19/22	0/1/1/1
4	NAG	R	1	2,4	-	2/6/23/26	0/1/1/1
4	NAG	R	2	4	-	2/6/23/26	0/1/1/1
4	MAN	R	3	4	-	0/2/19/22	0/1/1/1
3	NAG	V	1	3	-	5/6/23/26	0/1/1/1
3	NAG	V	2	3	-	1/6/23/26	0/1/1/1
3	NAG	X	1	3,1	-	2/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	X	2	3	-	2/6/23/26	0/1/1/1
4	NAG	c	1	4	-	2/6/23/26	0/1/1/1
4	NAG	c	2	4	-	3/6/23/26	0/1/1/1
4	MAN	c	3	4	-	1/2/19/22	0/1/1/1
3	NAG	g	1	3	-	2/6/23/26	0/1/1/1
3	NAG	g	2	3	-	5/6/23/26	0/1/1/1

There are no bond length outliers.

All (14) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	c	1	NAG	O5-C1-C2	-3.47	105.81	111.29
3	g	1	NAG	O5-C1-C2	-3.22	106.21	111.29
3	V	1	NAG	O5-C1-C2	-2.94	106.65	111.29
3	V	1	NAG	C4-C3-C2	2.56	114.77	111.02
4	c	2	NAG	C2-N2-C7	-2.50	119.34	122.90
4	N	3	MAN	C1-O5-C5	2.48	115.55	112.19
4	R	3	MAN	C1-O5-C5	2.40	115.44	112.19
3	g	1	NAG	C2-N2-C7	-2.31	119.61	122.90
3	g	1	NAG	C3-C4-C5	2.29	114.33	110.24
4	R	3	MAN	O2-C2-C3	-2.26	105.60	110.14
4	N	3	MAN	O2-C2-C3	-2.26	105.61	110.14
4	c	1	NAG	C2-N2-C7	-2.25	119.70	122.90
3	V	2	NAG	O5-C1-C2	-2.11	107.96	111.29
4	c	2	NAG	O5-C5-C4	-2.06	105.83	110.83

There are no chirality outliers.

All (36) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	V	1	NAG	O7-C7-N2-C2
3	g	1	NAG	C8-C7-N2-C2
3	g	1	NAG	O7-C7-N2-C2
3	g	2	NAG	C8-C7-N2-C2
3	g	2	NAG	O7-C7-N2-C2
4	c	2	NAG	C8-C7-N2-C2
4	c	2	NAG	O7-C7-N2-C2
3	V	1	NAG	C4-C5-C6-O6
3	V	1	NAG	C8-C7-N2-C2
3	G	2	NAG	O5-C5-C6-O6

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Mol	Chain	Res	Type	Atoms
3	V	1	NAG	O5-C5-C6-O6
3	g	2	NAG	C1-C2-N2-C7
3	X	2	NAG	C4-C5-C6-O6
3	G	2	NAG	C4-C5-C6-O6
4	R	2	NAG	O5-C5-C6-O6
3	X	2	NAG	O5-C5-C6-O6
3	G	1	NAG	O5-C5-C6-O6
3	G	1	NAG	C4-C5-C6-O6
4	R	1	NAG	O5-C5-C6-O6
4	R	2	NAG	C4-C5-C6-O6
4	R	1	NAG	C4-C5-C6-O6
3	g	2	NAG	O5-C5-C6-O6
3	E	2	NAG	O5-C5-C6-O6
4	c	3	MAN	O5-C5-C6-O6
3	X	1	NAG	C4-C5-C6-O6
4	N	1	NAG	C4-C5-C6-O6
4	N	1	NAG	O5-C5-C6-O6
4	N	1	NAG	C3-C2-N2-C7
4	c	1	NAG	C4-C5-C6-O6
3	g	2	NAG	C4-C5-C6-O6
3	V	2	NAG	O5-C5-C6-O6
4	c	1	NAG	O5-C5-C6-O6
3	X	1	NAG	O5-C5-C6-O6
3	V	1	NAG	C1-C2-N2-C7
4	N	2	NAG	C4-C5-C6-O6
4	c	2	NAG	O5-C5-C6-O6

There are no ring outliers.

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.

Oligosaccharide Chain E

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain G

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain V

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain X

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain g

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain N

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain R

Bond lengths

Bond angles

Torsions

Rings

Oligosaccharide Chain c

Bond lengths

Bond angles

Torsions

Rings

5.6 Ligand geometry ⓘ

12 ligands 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	$\#|Z| > 2$
5	NAG	A	805	1	14,14,15	0.23	0	17,19,21	0.43	0
5	NAG	A	801	1	14,14,15	0.84	1 (7%)	17,19,21	1.06	1 (5%)
5	NAG	C	801	1	14,14,15	0.92	1 (7%)	17,19,21	1.15	1 (5%)
5	NAG	C	802	1	14,14,15	0.44	0	17,19,21	0.50	0
5	NAG	A	803	1	14,14,15	0.45	0	17,19,21	0.37	0
5	NAG	C	805	-	14,14,15	0.41	0	17,19,21	1.16	2 (11%)
5	NAG	B	901	2	14,14,15	0.44	0	17,19,21	1.26	1 (5%)
5	NAG	C	804	1	14,14,15	0.23	0	17,19,21	0.40	0
5	NAG	A	802	1	14,14,15	0.23	0	17,19,21	0.47	0

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	#|Z| > 2	Counts	RMSZ	#|Z| > 2
5	NAG	C	803	1	14,14,15	0.39	0	17,19,21	0.37	0
5	NAG	D	901	2	14,14,15	0.42	0	17,19,21	1.16	2 (11%)
5	NAG	A	804	1	14,14,15	0.42	0	17,19,21	0.70	1 (5%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
5	NAG	A	805	1	-	2/6/23/26	0/1/1/1
5	NAG	A	801	1	-	2/6/23/26	0/1/1/1
5	NAG	C	801	1	-	2/6/23/26	0/1/1/1
5	NAG	C	802	1	-	0/6/23/26	0/1/1/1
5	NAG	A	803	1	-	2/6/23/26	0/1/1/1
5	NAG	C	805	-	-	0/6/23/26	0/1/1/1
5	NAG	B	901	2	-	5/6/23/26	0/1/1/1
5	NAG	C	804	1	-	2/6/23/26	0/1/1/1
5	NAG	A	802	1	-	1/6/23/26	0/1/1/1
5	NAG	C	803	1	-	2/6/23/26	0/1/1/1
5	NAG	D	901	2	-	0/6/23/26	0/1/1/1
5	NAG	A	804	1	-	0/6/23/26	0/1/1/1

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	C	801	NAG	O5-C1	3.20	1.48	1.43
5	A	801	NAG	O5-C1	2.90	1.48	1.43

All (8) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
5	C	801	NAG	C1-O5-C5	4.49	118.27	112.19
5	B	901	NAG	C2-N2-C7	4.24	128.94	122.90
5	A	801	NAG	C1-O5-C5	4.11	117.76	112.19
5	A	804	NAG	C1-O5-C5	2.39	115.43	112.19
5	C	805	NAG	C8-C7-N2	2.29	119.97	116.10
5	D	901	NAG	C8-C7-N2	2.27	119.94	116.10
5	D	901	NAG	C2-N2-C7	-2.06	119.97	122.90
5	C	805	NAG	C2-N2-C7	-2.03	120.01	122.90

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
5	A	803	NAG	C4-C5-C6-O6
5	A	803	NAG	O5-C5-C6-O6
5	C	804	NAG	O5-C5-C6-O6
5	A	801	NAG	O5-C5-C6-O6
5	C	804	NAG	C4-C5-C6-O6
5	A	805	NAG	O5-C5-C6-O6
5	B	901	NAG	C8-C7-N2-C2
5	B	901	NAG	O7-C7-N2-C2
5	A	805	NAG	C4-C5-C6-O6
5	A	801	NAG	C4-C5-C6-O6
5	C	803	NAG	O5-C5-C6-O6
5	B	901	NAG	O5-C5-C6-O6
5	C	801	NAG	C4-C5-C6-O6
5	A	802	NAG	O5-C5-C6-O6
5	C	801	NAG	O5-C5-C6-O6
5	C	803	NAG	C4-C5-C6-O6
5	B	901	NAG	C4-C5-C6-O6
5	B	901	NAG	C3-C2-N2-C7

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-34674. 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 ⓘ

6.1.1 Primary map

| X | Y | Z |

6.1.2 Raw map

| X | Y | Z |
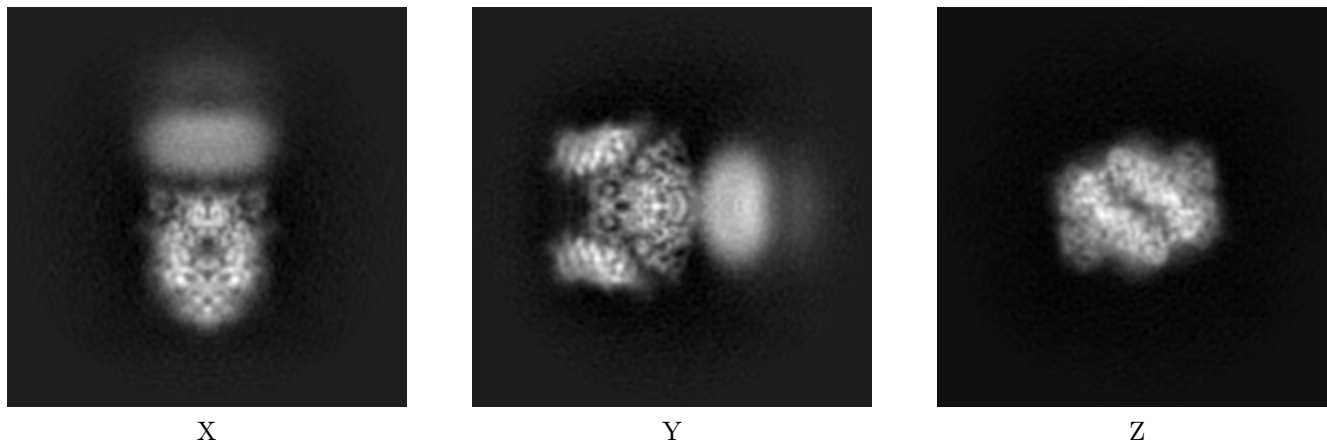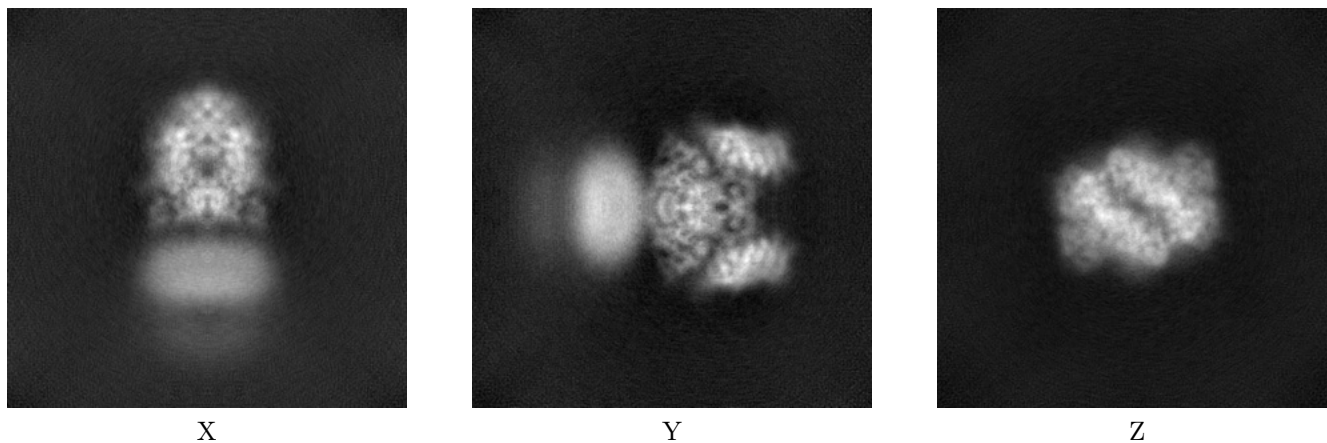
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
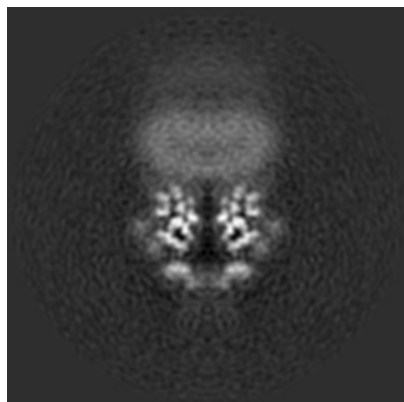
6.2.1 Primary map
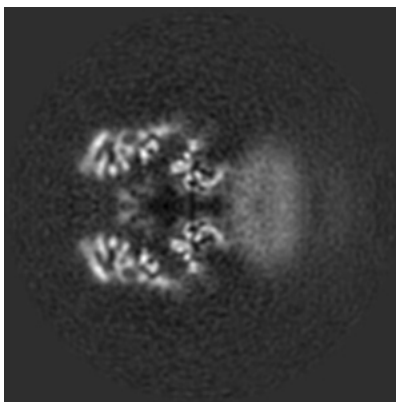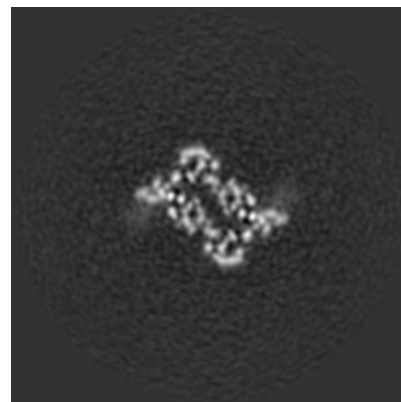
| X Index: 145 | Y Index: 145 | Z Index: 145 |

6.2.2 Raw map
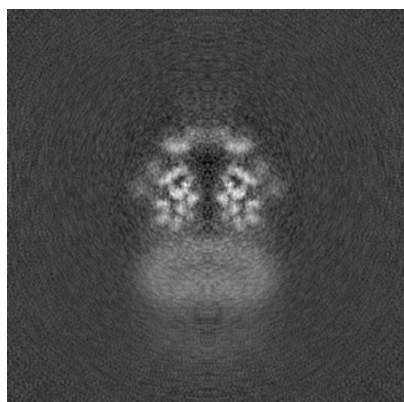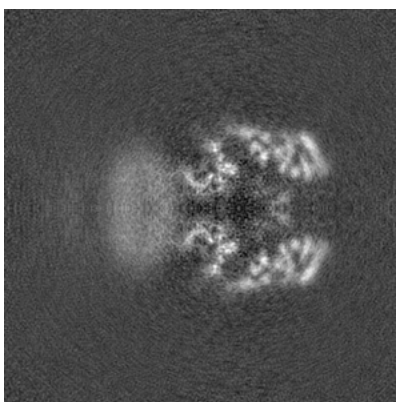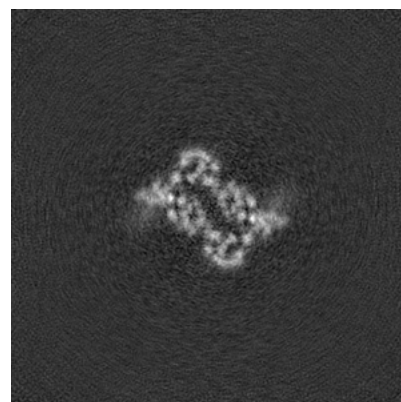
| X Index: 145 | Y Index: 145 | Z Index: 145 |

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
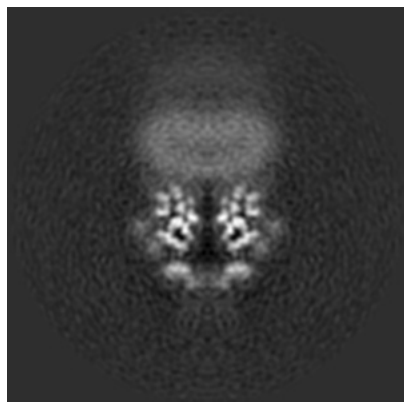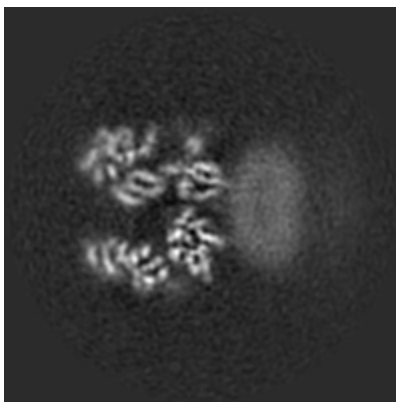
| X Index: 145 | Y Index: 150 | Z Index: 98 |
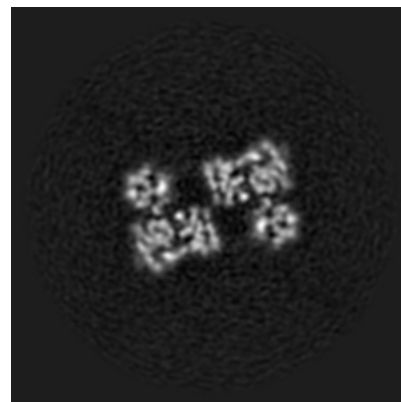
6.3.2 Raw map
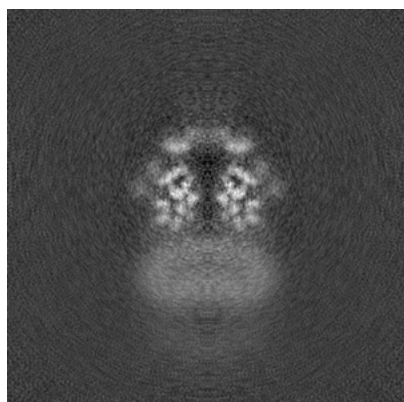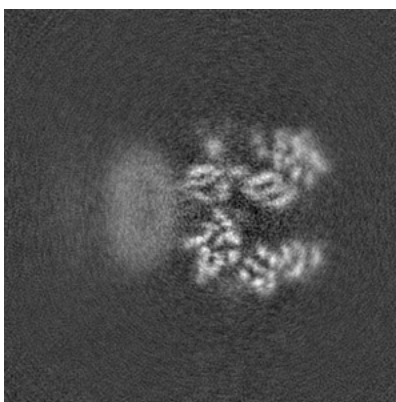
| X Index: 145 | Y Index: 151 | Z Index: 190 |
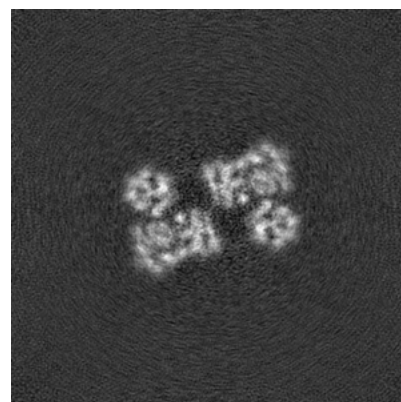
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map

X   Y   Z

6.4.2 Raw map

X   Y   Z
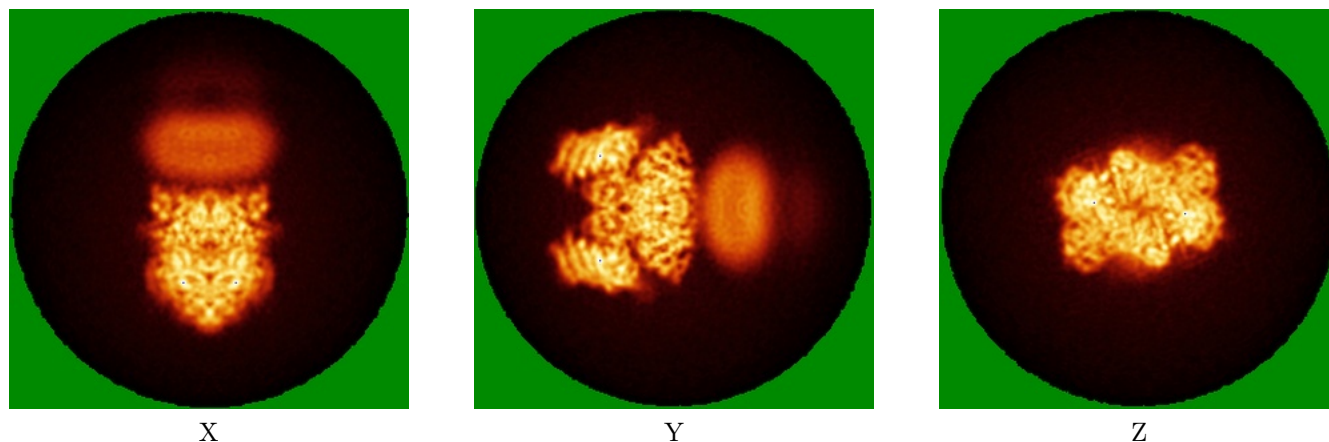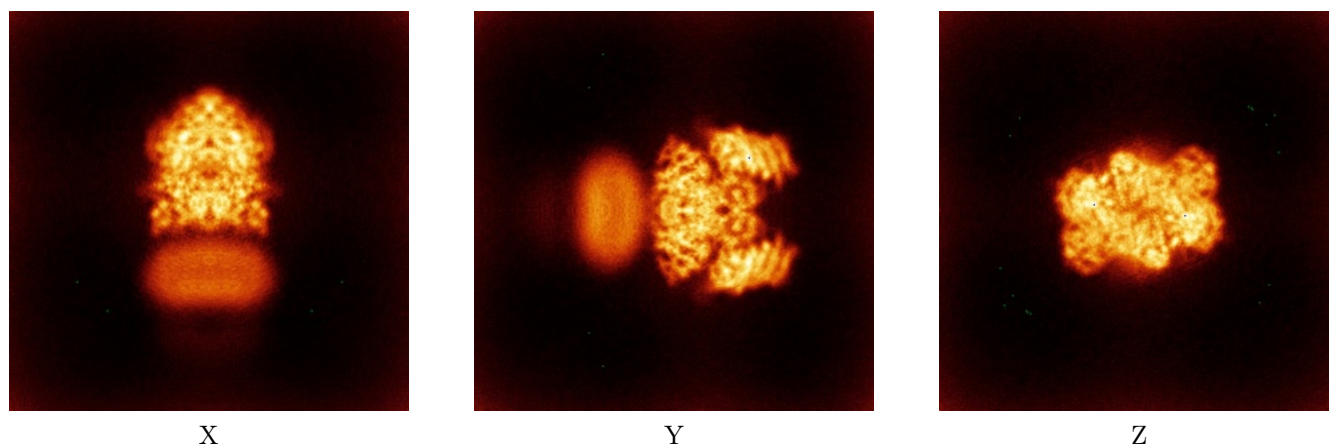
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5   Orthogonal surface views   ⓘ

6.5.1   Primary map

X   Y   Z
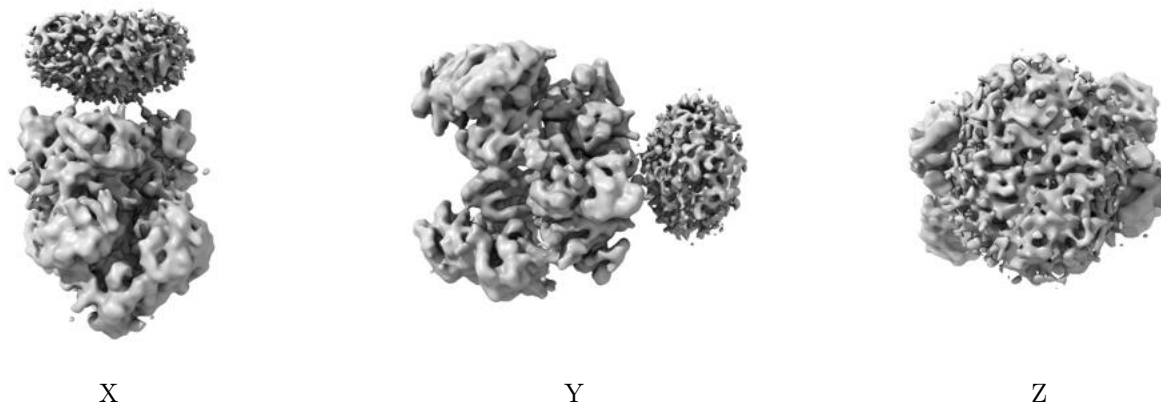
The images above show the 3D surface view of the map at the recommended contour level 0.246. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2   Raw map

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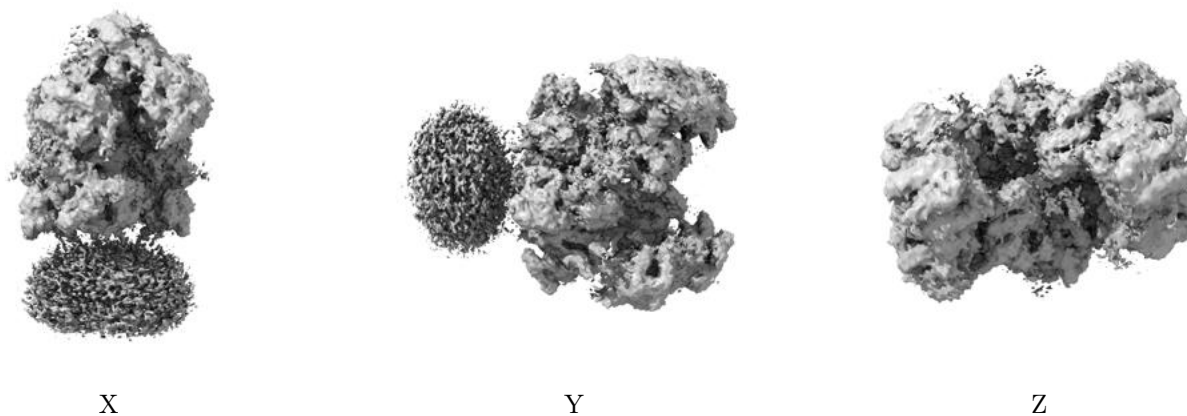
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6   Mask visualisation   ⓘ

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

7 Map analysis ⓘ

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

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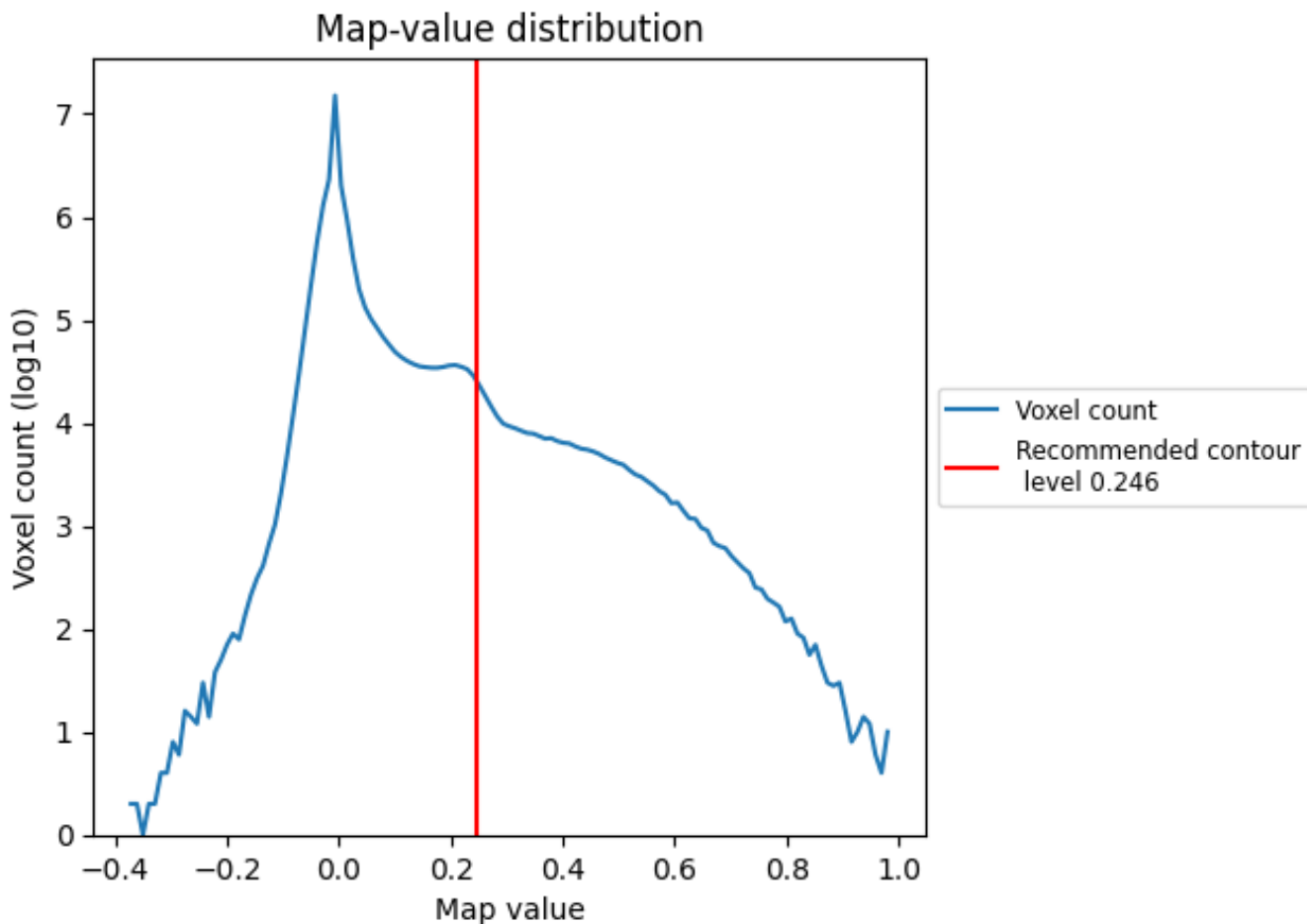
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2　Volume estimate ⓘ
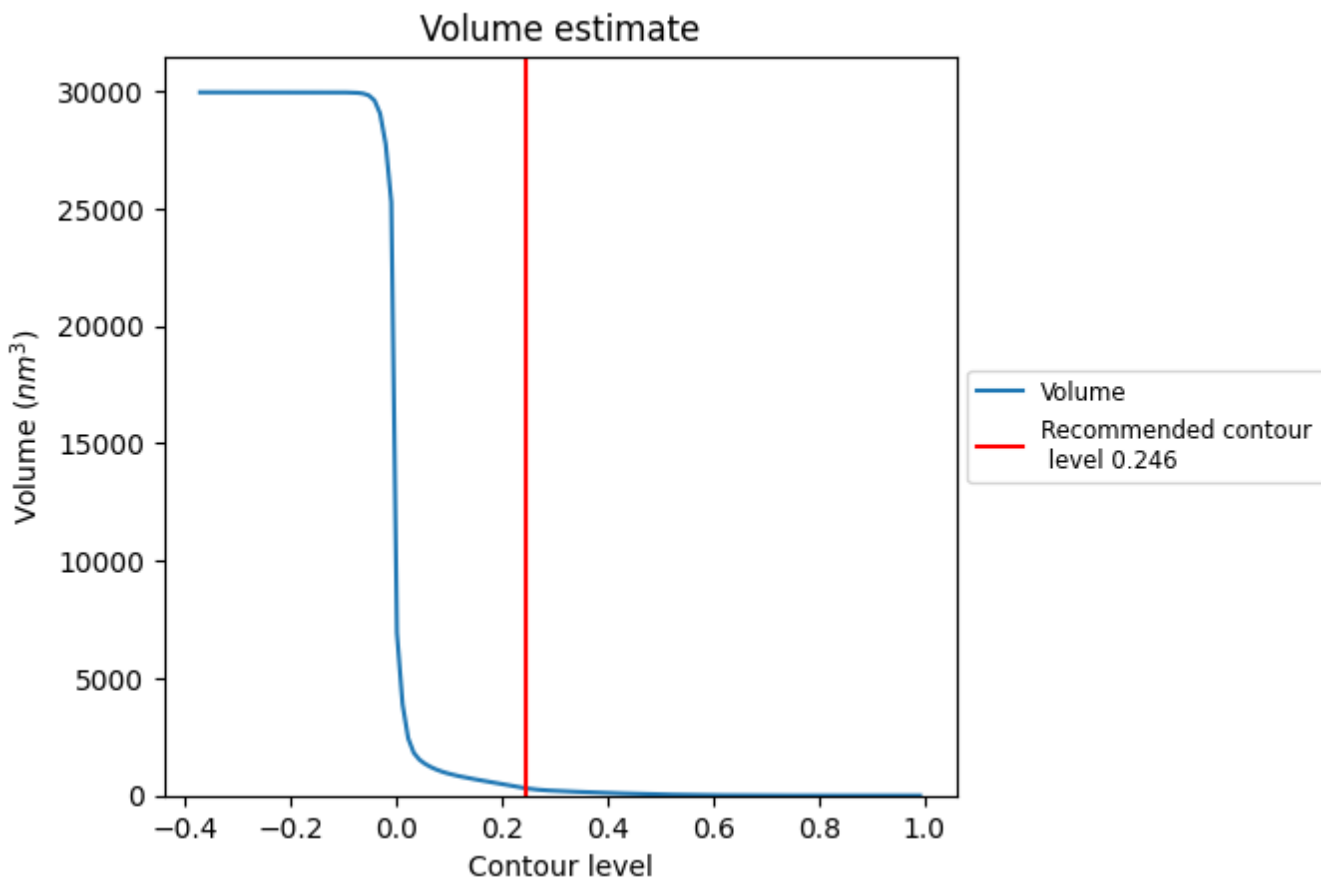
The volume at the recommended contour level is 307 nm^3; this corresponds to an approximate mass of 277 kDa.

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 ⓘ
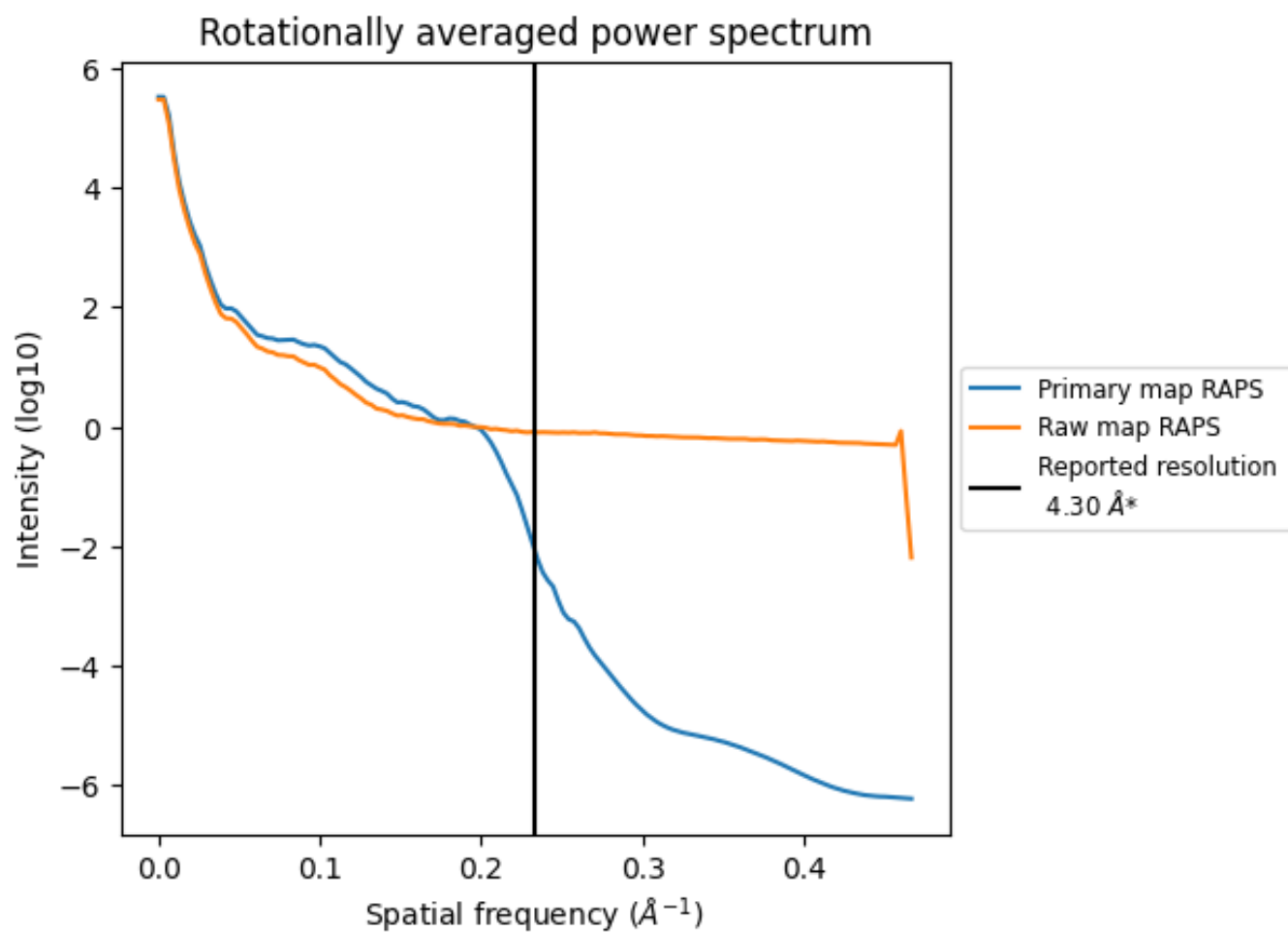
*Reported resolution corresponds to spatial frequency of 0.233 Å^{-1}

8 Fourier-Shell correlation ⓘ

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 ⓘ
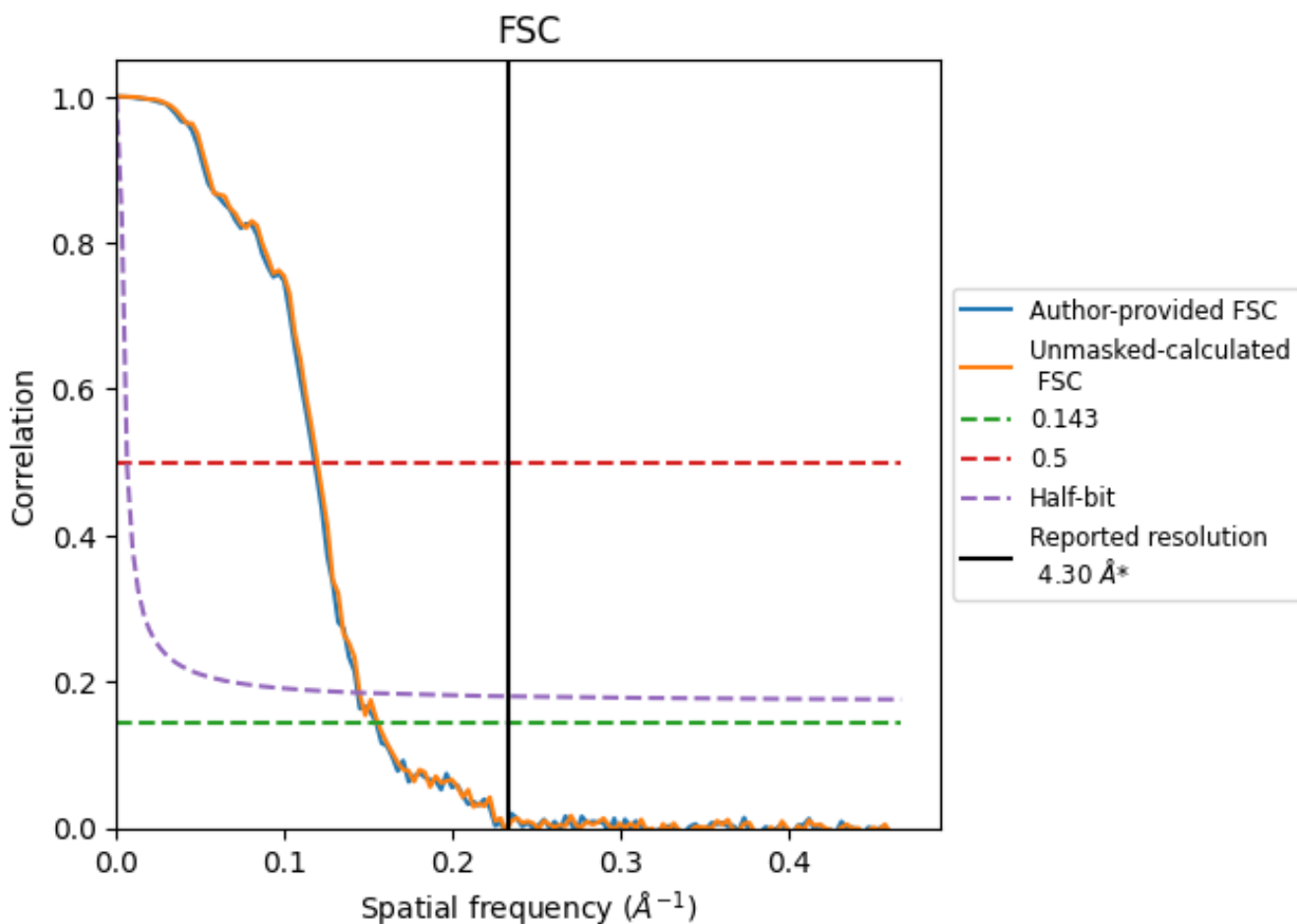
*Reported resolution corresponds to spatial frequency of 0.233 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	-	-	-
Author-provided FSC curve	6.46	8.48	6.97
Unmasked-calculated*	6.42	8.36	6.91

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-34674 and PDB model 8HDK. Per-residue inclusion information can be found in section 3 on page 7.

9.1 Map-model overlay ⓘ

| X | Y | Z |
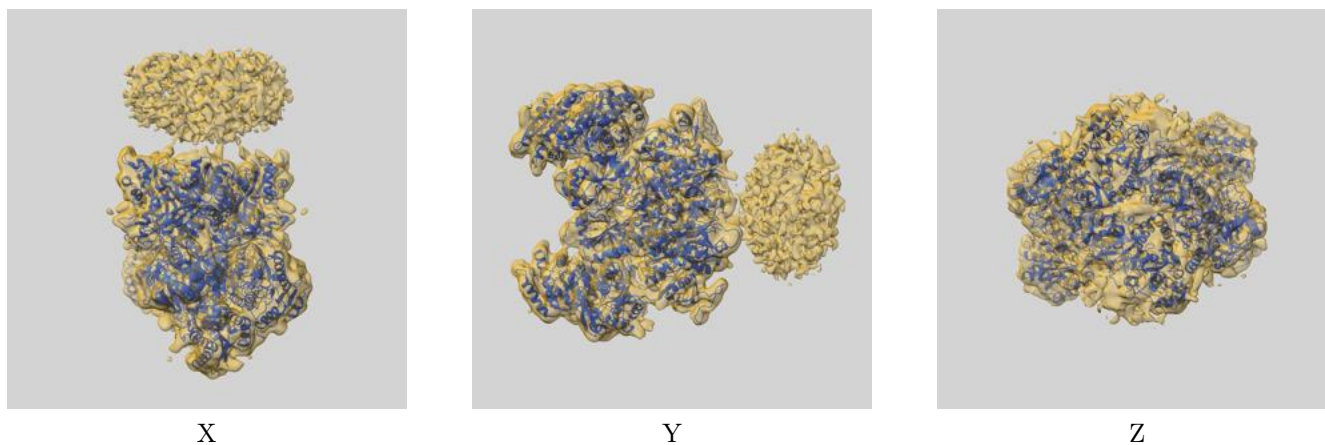
The images above show the 3D surface view of the map at the recommended contour level 0.246 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ

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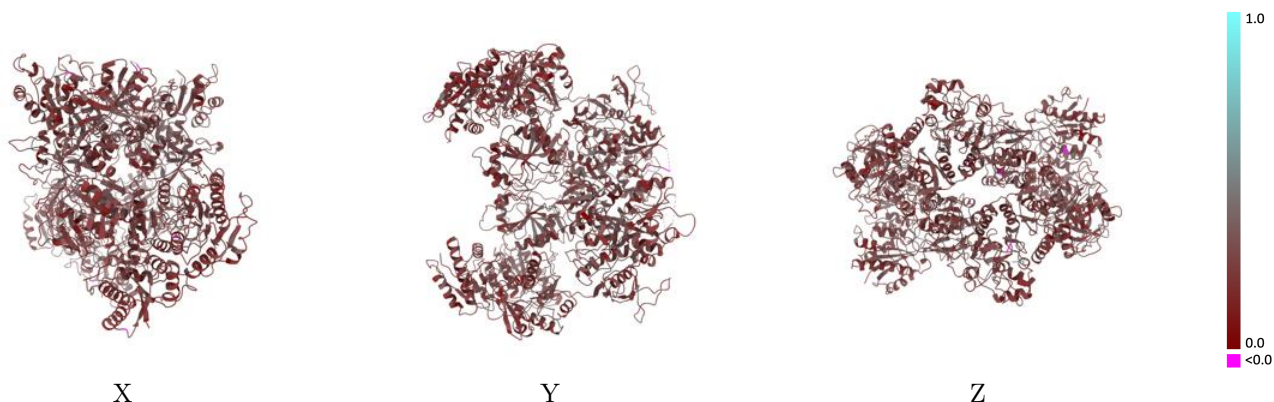
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

X Y Z
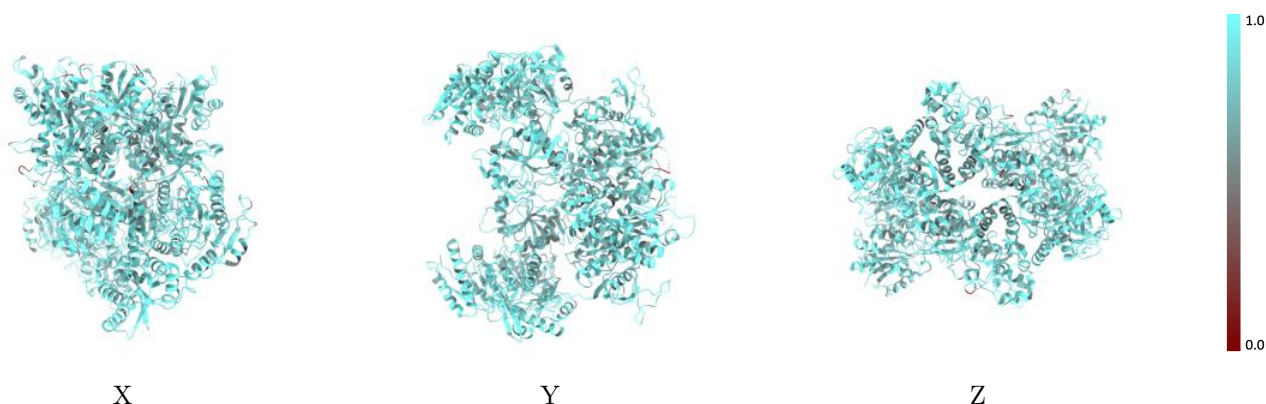
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.246).

9.4　Atom inclusion ⓘ
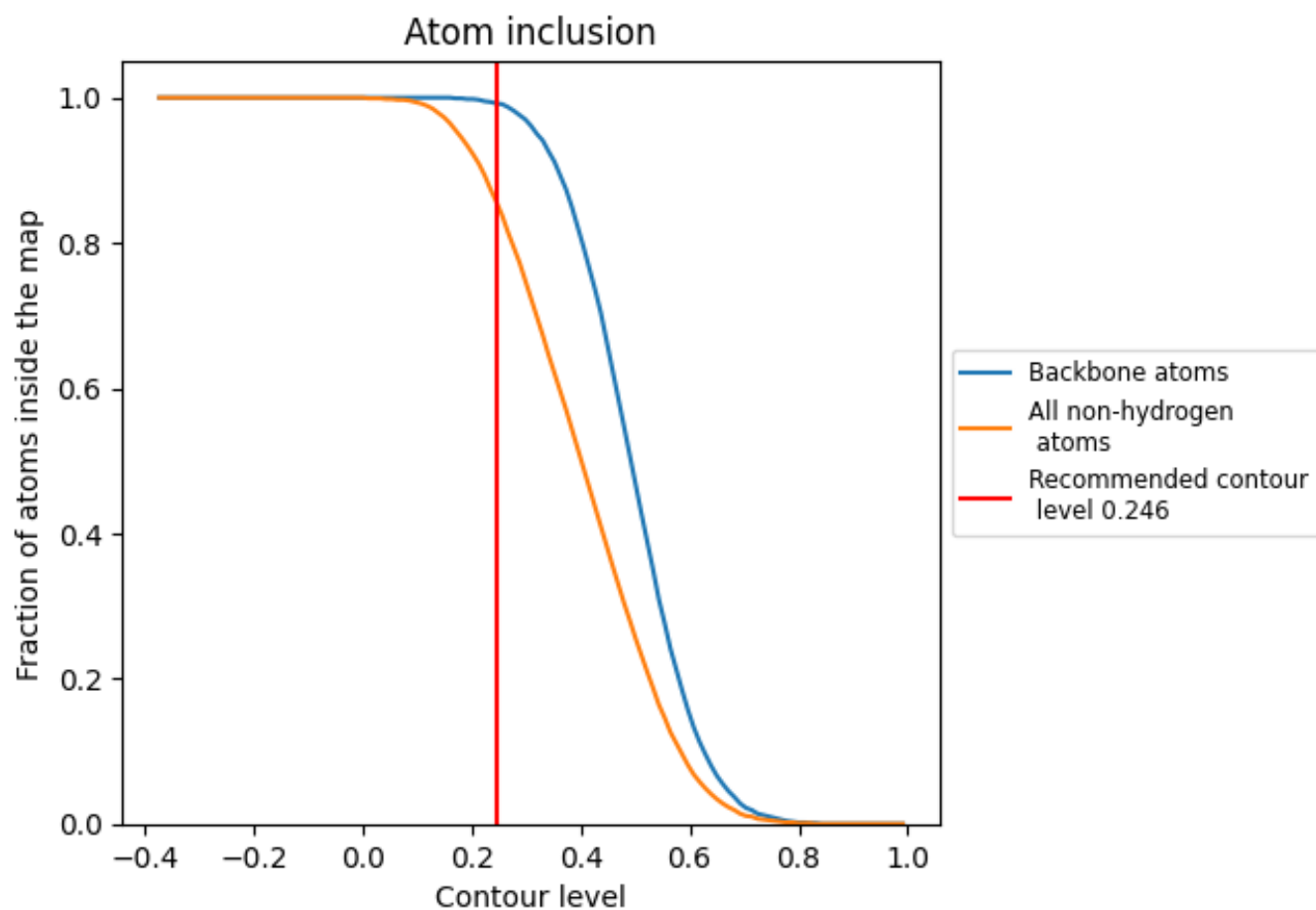
At the recommended contour level, 99% of all backbone atoms, 86% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.246) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8560	0.2640
A	0.8670	0.2600
B	0.8470	0.2680
C	0.8710	0.2600
D	0.8490	0.2670
E	0.6430	0.2880
G	0.8210	0.3000
N	0.7180	0.3080
R	0.5380	0.3090
V	0.6430	0.2780
X	0.6430	0.3010
c	0.5640	0.2980
g	0.6430	0.3360

1.0

0.0
<0.0