Full wwPDB EM Validation Report ⓘ

Jun 11, 2026 – 10:14 AM EDT

PDB ID	:	9YX8 / pdb_00009yx8
EMDB ID	:	EMD-73599
Title	:	Local refinement of BA.3.2.1 spike (3-RBD-down), RBD-A, RBD-C and NTD-B
Authors	:	Wang, Y.; Hu, Y.; Chen, Z.; Liang, B.; Xie, X.
Deposited on	:	2025-10-26
Resolution	:	2.85 Å(reported)

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

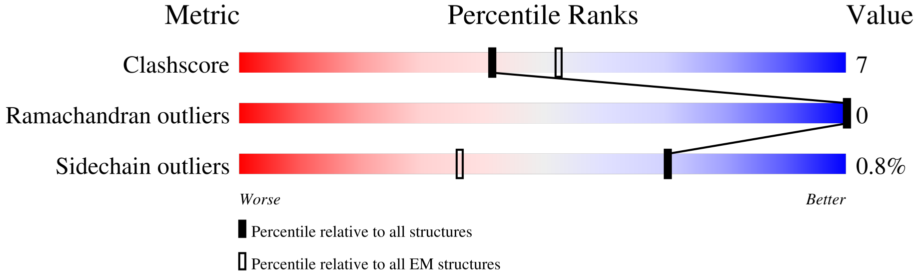
EMDB validation analysis	:	0.0.1.dev132
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.49

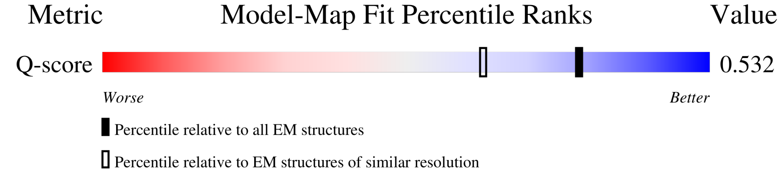
1 Overall quality at a glance ⓘ

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

The reported resolution of this entry is 2.85 Å.

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





Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	11965 (2.35 - 3.35)

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	1250	
1	B	1250	
1	C	1250	

2 Entry composition

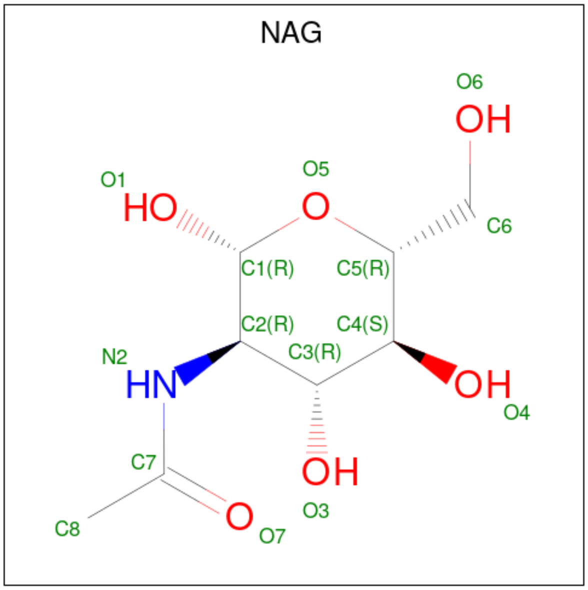
There are 2 unique types of molecules in this entry. The entry contains 4848 atoms, of which 0 are hydrogens and 0 are deuteriums.

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 SARS-CoV-2 BA.3.2.1 spike.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	188	1537	998	252	280	7	0	0
1	B	209	1690	1104	276	307	3	0	0
1	C	188	1537	998	252	280	7	0	0

- Molecule 2 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).



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

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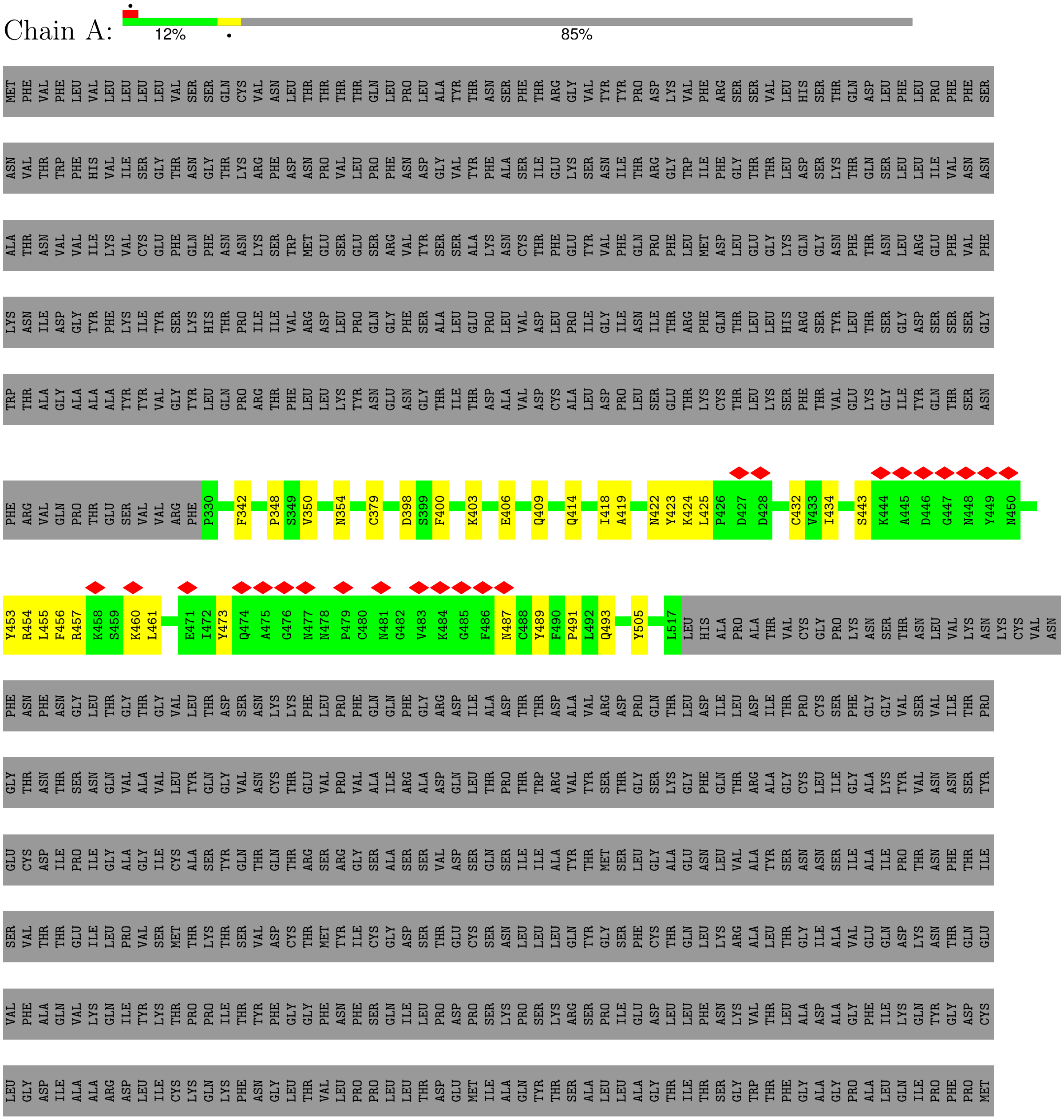
Mol	Chain	Residues	Atoms	AltConf
2	B	1	Total C N O 14 8 1 5	0
2	C	1	Total C N O 14 8 1 5	0
2	C	1	Total C N O 14 8 1 5	0

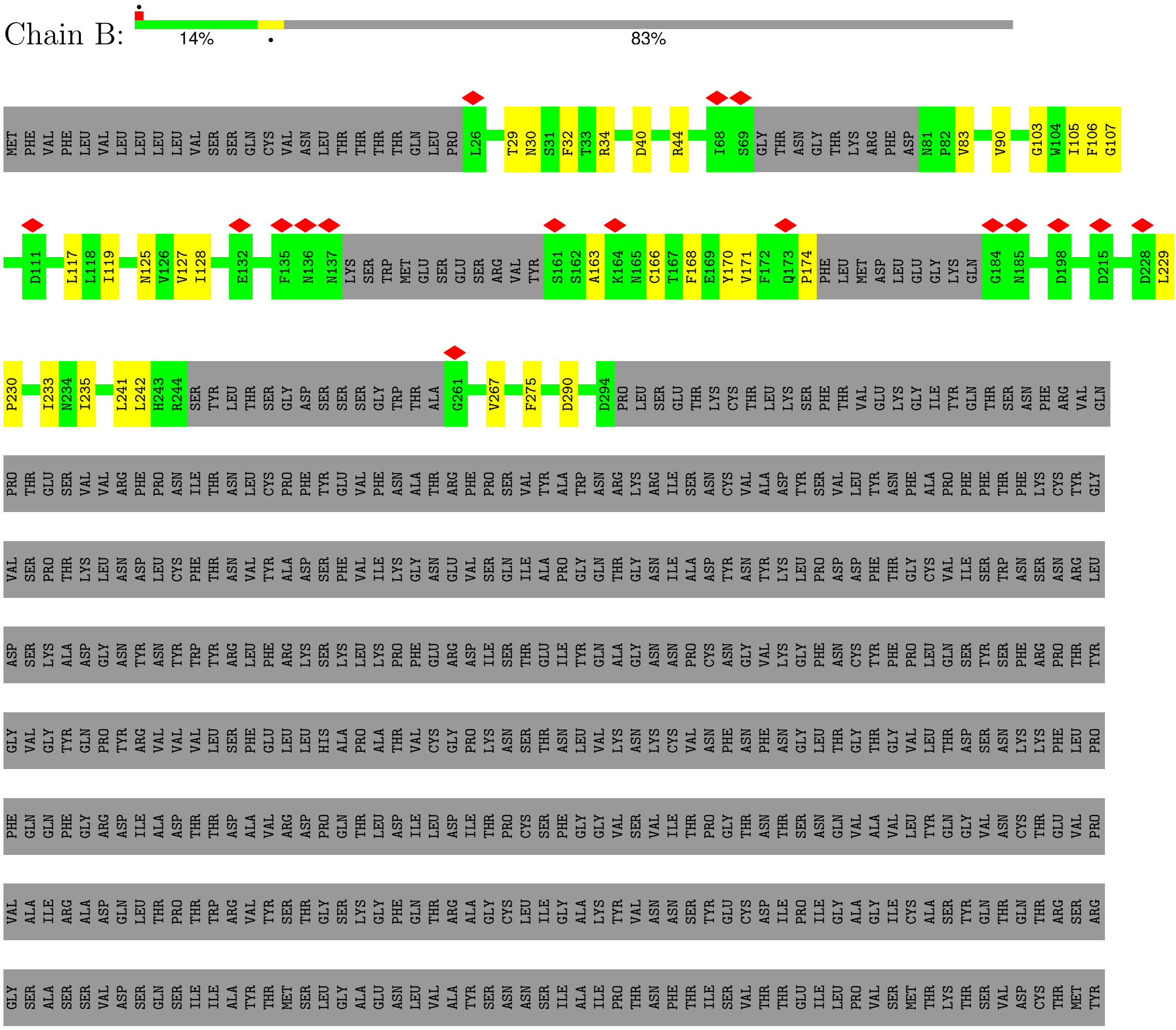
3 Residue-property plots ⓘ

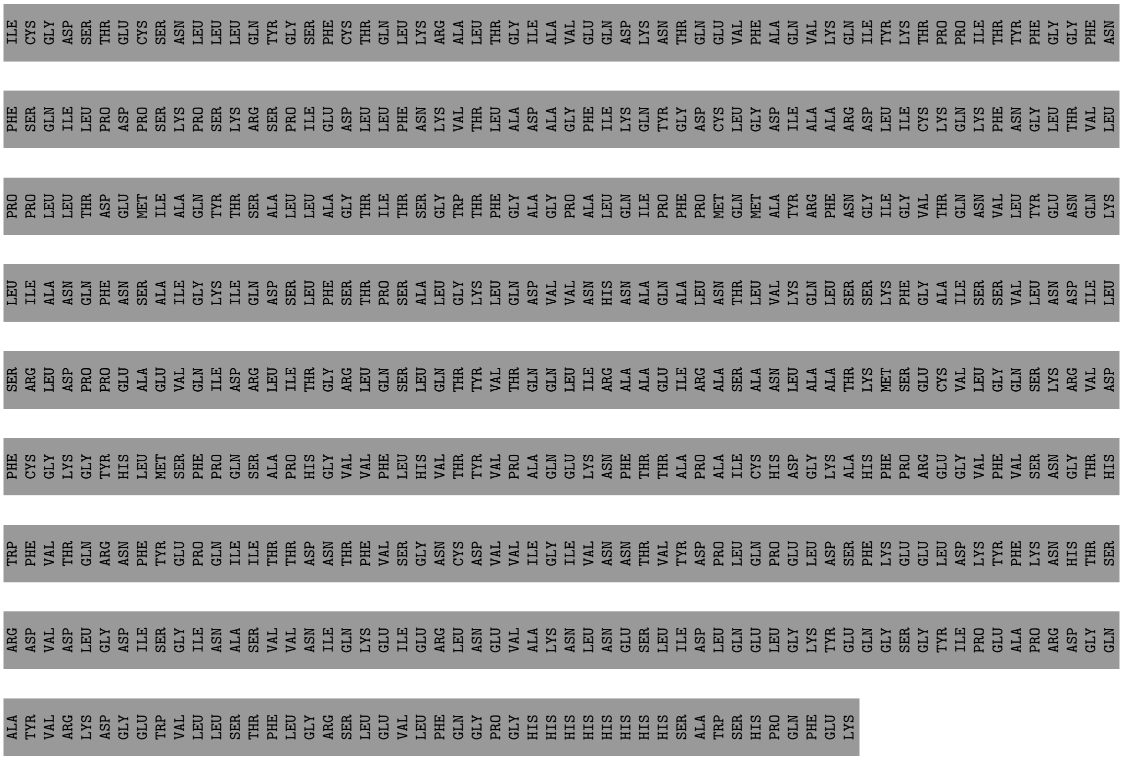
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion 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: SARS-CoV-2 BA.3.2.1 spike

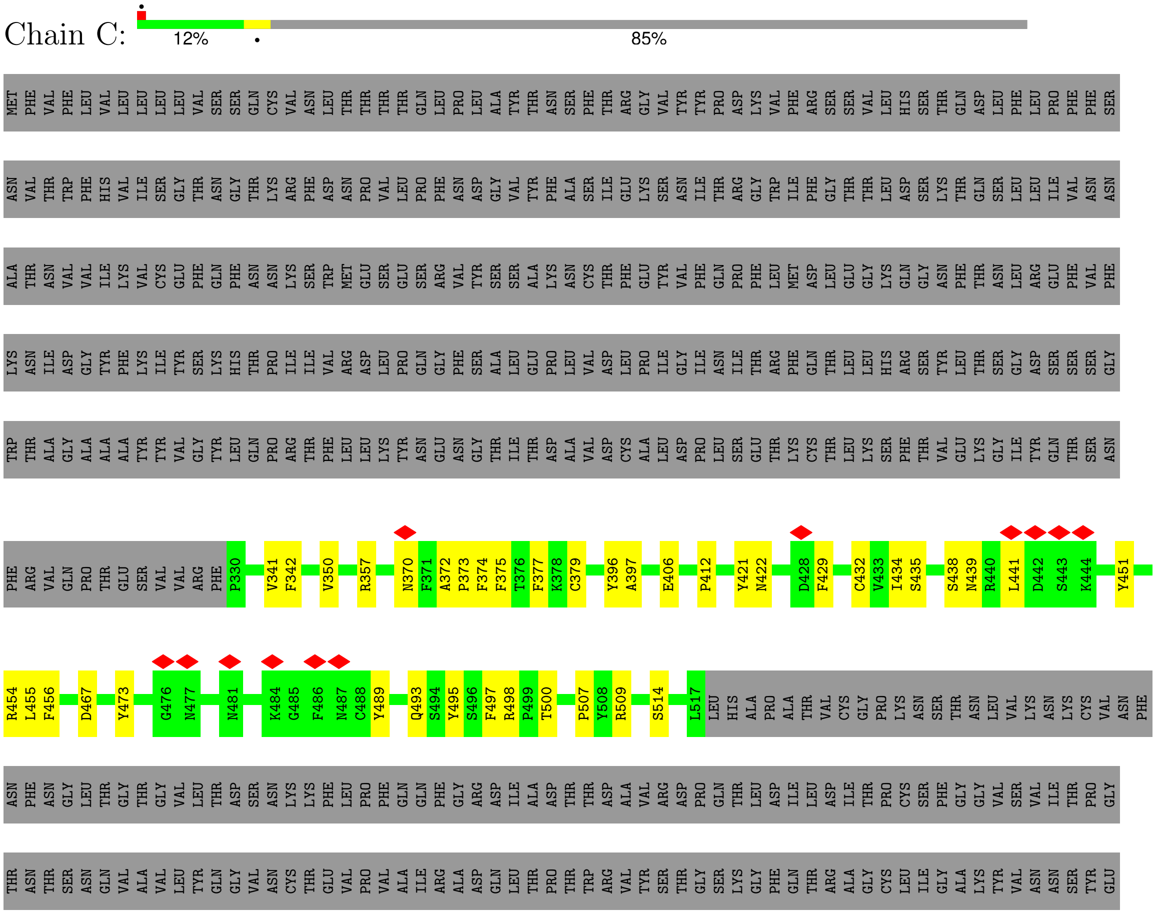


- Molecule 1: SARS-CoV-2 BA.3.2.1 spike





- Molecule 1: SARS-CoV-2 BA.3.2.1 spike



CYS ASP ILE PRO ILE GLY ALA GLY ILE CYS ALA SER TYR GLN THR GLN THR ARG SER ARG GLY SER ALA SER SER VAL ASP SER GLN SER ILE ILE ALA TYR THR MET SER LEU GLY ALA GLU ASN LEU VAL ALA TYR SER ASN ASN SER ILE ALA ILE PRO THR ASN PHE THR ILE SER

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

PHE ALA GLN VAL LYS GLN ILE TYR LYS THR PRO PRO ILE THR TYR PHE GLY GLY PHE ASN PHE SER GLN ILE LEU PRO ASP PRO SER LYS PRO SER LYS ARG SER PRO ILE GLU ASP LEU LEU PHE ASN LYS VAL THR LEU ALA ASP ALA GLY PHE ILE LYS GLN TYR GLY ASP CYS LEU

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

MET ALA TYR ARG PHE ASN GLY ILE GLY VAL THR GLN ASN VAL LEU TYR GLU ASN GLN LYS LEU ILE ALA ASN GLN PHE ASN SER ALA ILE GLY LYS ILE GLN ASP SER LEU PHE SER THR PRO SER ALA LEU GLY LYS LEU GLN ASP VAL VAL ASN HIS ASN ALA GLN ALA LEU ASN THR

LEU VAL LYS GLN LEU SER SER LYS PHE GLY ALA ILE SER SER VAL LEU ASN ASP ILE LEU SER ARG LEU ASP PRO PRO GLU ALA GLU VAL GLN ILE ASP ARG LEU ILE THR GLY ARG LEU GLN SER LEU GLN THR TYR VAL THR GLN GLN LEU ILE ARG ALA ALA GLU ILE ARG ALA SER

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

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

GLN PRO GLU LEU ASP SER PHE LYS GLU GLU LEU ASP LYS TYR PHE LYS ASN HIS THR SER ARG ASP VAL ASP LEU GLY ASP ILE SER GLY ILE ASN ALA SER VAL VAL ASN ILE GLN LYS GLU ILE GLU ARG LEU ASN GLU VAL ALA LYS ASN LEU ASN GLU SER LEU ILE ASP LEU GLN

GLU LEU GLY LYS TYR GLU GLN GLY SER GLY TYR ILE PRO GLU ALA PRO ARG ASP GLY GLN ALA TYR VAL ARG LYS ASP GLY GLU TRP VAL LEU LEU SER THR PHE LEU GLY ARG SER LEU GLU VAL LEU PHE GLN GLY PRO GLY HIS HIS HIS HIS HIS HIS HIS HIS SER ALA TRP SER

HIS PRO GLN PHE GLU LYS

4 Experimental information

Property	**Value**	**Source**
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	673009	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 $(e^-/\text{Å}^2)$	39.84	Depositor
Minimum defocus (nm)	900	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	10500	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.680	Depositor
Minimum map value	-0.274	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.013	Depositor
Recommended contour level	0.14	Depositor
Map size (Å)	346.112, 346.112, 346.112	wwPDB
Map dimensions	416, 416, 416	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.832, 0.832, 0.832	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: 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	0.18	0/1587	0.34	0/2160
1	B	0.23	0/1734	0.42	0/2357
1	C	0.13	0/1587	0.29	0/2160
All	All	0.19	0/4908	0.36	0/6677

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	1537	0	1452	25	0
1	B	1690	0	1645	19	0
1	C	1537	0	1451	24	0
2	A	14	0	13	0	0
2	B	42	0	39	0	0
2	C	28	0	26	0	0
All	All	4848	0	4626	64	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

All (64) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:409:GLN:HA	1:A:414:GLN:HG2	1.76	0.68
1:B:83:VAL:HG23	1:B:83:VAL:O	2.02	0.59
1:C:412:PRO:HG3	1:C:429:PHE:HB3	1.86	0.58
1:B:32:PHE:O	1:B:34:ARG:HG2	2.05	0.57
1:A:422:ASN:HD21	1:A:453:TYR:HB2	1.71	0.56
1:C:421:TYR:HB3	1:C:454:ARG:HG2	1.89	0.53
1:B:128:ILE:HD13	1:B:229:LEU:HD11	1.90	0.53
1:B:168:PHE:CE2	1:B:229:LEU:HD22	2.44	0.52
1:B:127:VAL:HG22	1:B:171:VAL:HG13	1.91	0.52
1:B:275:PHE:CE1	1:B:290:ASP:HB3	2.45	0.52
1:A:422:ASN:OD1	1:A:454:ARG:HB3	2.09	0.52
1:C:454:ARG:NH1	1:C:467:ASP:O	2.43	0.52
1:C:439:ASN:ND2	1:C:498:ARG:O	2.41	0.51
1:B:125:ASN:HA	1:B:174:PRO:HD2	1.93	0.51
1:B:168:PHE:HE2	1:B:229:LEU:HD22	1.76	0.51
1:A:455:LEU:HD21	1:C:373:PRO:HB3	1.93	0.49
1:A:348:PRO:HG3	1:A:354:ASN:HB2	1.94	0.49
1:B:230:PRO:O	1:C:357:ARG:NH1	2.45	0.49
1:A:455:LEU:HD12	1:A:493:GLN:HB2	1.94	0.49
1:B:29:THR:HG22	1:B:30:ASN:H	1.78	0.48
1:A:422:ASN:ND2	1:A:453:TYR:HB2	2.29	0.47
1:B:105:ILE:HD11	1:B:241:LEU:HD21	1.97	0.47
1:A:456:PHE:HD2	1:A:491:PRO:HA	1.80	0.46
1:C:422:ASN:OD1	1:C:454:ARG:N	2.44	0.46
1:B:119:ILE:HG12	1:B:128:ILE:HG12	1.97	0.46
1:C:439:ASN:ND2	1:C:500:THR:O	2.49	0.46
1:A:342:PHE:HZ	1:A:434:ILE:HD12	1.81	0.46
1:B:40:ASP:OD2	1:B:44:ARG:NH2	2.49	0.46
1:C:406:GLU:OE2	1:C:495:TYR:OH	2.28	0.46
1:C:497:PHE:HB3	1:C:507:PRO:HG3	1.97	0.46
1:C:438:SER:HB3	1:C:509:ARG:HG3	1.98	0.46
1:B:128:ILE:HB	1:B:170:TYR:HB3	1.99	0.45
1:A:419:ALA:O	1:A:424:LYS:HD2	2.16	0.45
1:C:455:LEU:HD22	1:C:493:GLN:HG3	1.98	0.45
1:A:457:ARG:NH1	1:A:460:LYS:O	2.50	0.45
1:A:460:LYS:HG2	1:A:461:LEU:N	2.31	0.45
1:B:103:GLY:HA3	1:B:119:ILE:O	2.17	0.45
1:B:106:PHE:HB2	1:B:117:LEU:HB3	1.99	0.45
1:C:350:VAL:HG22	1:C:422:ASN:HB3	1.99	0.45
1:C:456:PHE:HB3	1:C:473:TYR:CD2	2.53	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:341:VAL:HG11	1:C:397:ALA:HB1	1.99	0.44
1:A:350:VAL:HG21	1:A:418:ILE:HG23	2.00	0.44
1:A:379:CYS:HA	1:A:432:CYS:HA	2.00	0.43
1:A:456:PHE:HB3	1:A:473:TYR:CG	2.53	0.43
1:B:163:ALA:HB1	1:B:166:CYS:SG	2.58	0.43
1:C:342:PHE:HZ	1:C:434:ILE:HD13	1.83	0.43
1:B:90:VAL:HG23	1:B:267:VAL:HG13	2.00	0.43
1:A:456:PHE:HD1	1:C:370:ASN:OD1	2.02	0.43
1:C:451:TYR:HB2	1:C:495:TYR:HB2	2.00	0.43
1:A:443:SER:O	1:A:443:SER:OG	2.35	0.42
1:C:375:PHE:N	1:C:435:SER:O	2.52	0.42
1:C:396:TYR:HB2	1:C:514:SER:OG	2.19	0.42
1:A:456:PHE:HB3	1:A:473:TYR:CD2	2.54	0.42
1:B:107:GLY:H	1:B:235:ILE:HG23	1.86	0.41
1:C:379:CYS:HA	1:C:432:CYS:HA	2.02	0.41
1:A:460:LYS:HG2	1:A:461:LEU:H	1.86	0.41
1:C:372:ALA:HB1	1:C:441:LEU:HD11	2.02	0.41
1:A:398:ASP:OD2	1:A:423:TYR:OH	2.32	0.40
1:A:425:LEU:HD23	1:A:425:LEU:HA	1.87	0.40
1:C:374:PHE:CD2	1:C:377:PHE:HD2	2.39	0.40
1:A:350:VAL:HA	1:A:400:PHE:HB2	2.03	0.40
1:A:456:PHE:HA	1:C:370:ASN:OD1	2.21	0.40
1:A:403:LYS:HD2	1:A:505:TYR:HA	2.04	0.40
1:A:487:ASN:HA	1:A:489:TYR:CZ	2.56	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	186/1250 (15%)	181 (97%)	5 (3%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	199/1250 (16%)	185 (93%)	14 (7%)	0	100	100
1	C	186/1250 (15%)	183 (98%)	3 (2%)	0	100	100
All	All	571/3750 (15%)	549 (96%)	22 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	168/1095 (15%)	167 (99%)	1 (1%)	78	89
1	B	188/1095 (17%)	186 (99%)	2 (1%)	65	81
1	C	168/1095 (15%)	167 (99%)	1 (1%)	78	89
All	All	524/3285 (16%)	520 (99%)	4 (1%)	70	86

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	406	GLU
1	B	233	ILE
1	B	242	LEU
1	C	489	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (1) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	122	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 ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

6 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	$\#\|Z\| > 2$
2	NAG	B	1302	1	14,14,15	0.73	0	17,19,21	1.16	1 (5%)
2	NAG	C	1301	1	14,14,15	0.73	0	17,19,21	0.85	0
2	NAG	B	1303	1	14,14,15	0.38	0	17,19,21	0.55	0
2	NAG	C	1302	1	14,14,15	0.71	0	17,19,21	0.75	0
2	NAG	A	1301	1	14,14,15	0.72	0	17,19,21	0.81	0
2	NAG	B	1301	1	14,14,15	0.71	0	17,19,21	1.06	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
2	NAG	B	1302	1	-	2/6/23/26	0/1/1/1
2	NAG	C	1301	1	-	2/6/23/26	0/1/1/1
2	NAG	B	1303	1	-	2/6/23/26	0/1/1/1
2	NAG	C	1302	1	-	0/6/23/26	0/1/1/1
2	NAG	A	1301	1	-	0/6/23/26	0/1/1/1
2	NAG	B	1301	1	-	3/6/23/26	0/1/1/1

There are no bond length outliers.

All (2) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
2	B	1301	NAG	C2-N2-C7	3.30	127.32	122.90
2	B	1302	NAG	C2-N2-C7	3.22	127.22	122.90

There are no chirality outliers.

All (9) torsion outliers are listed below:

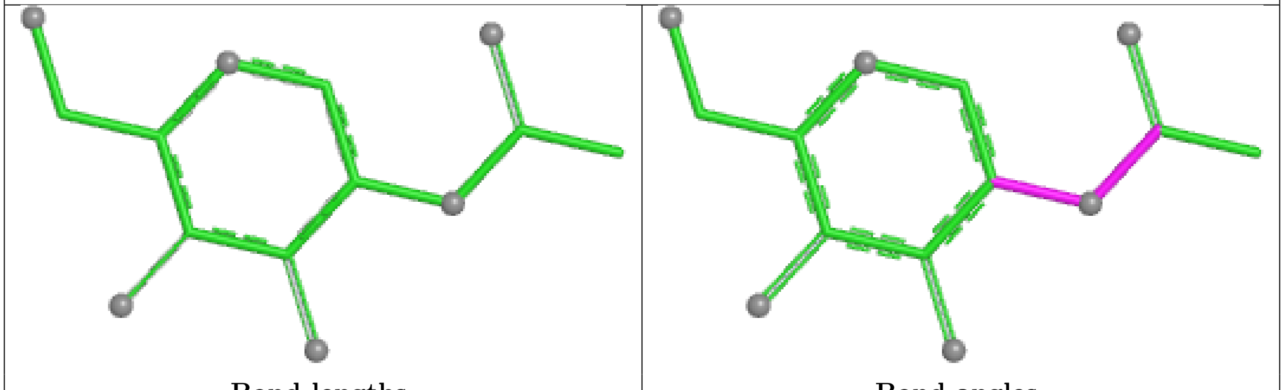
Mol	Chain	Res	Type	Atoms
2	C	1301	NAG	C8-C7-N2-C2
2	C	1301	NAG	O7-C7-N2-C2
2	B	1301	NAG	O5-C5-C6-O6
2	B	1303	NAG	O5-C5-C6-O6
2	B	1301	NAG	C3-C2-N2-C7
2	B	1302	NAG	C3-C2-N2-C7
2	B	1301	NAG	C1-C2-N2-C7
2	B	1302	NAG	C1-C2-N2-C7
2	B	1303	NAG	C3-C2-N2-C7

There are no ring outliers.

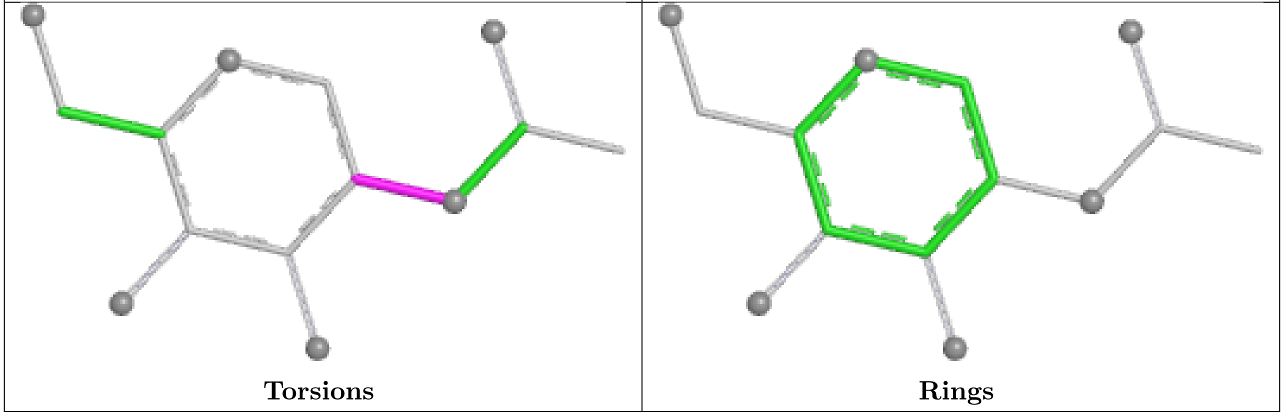
No monomer is involved in short contacts.

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less then 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

Ligand NAG B 1302

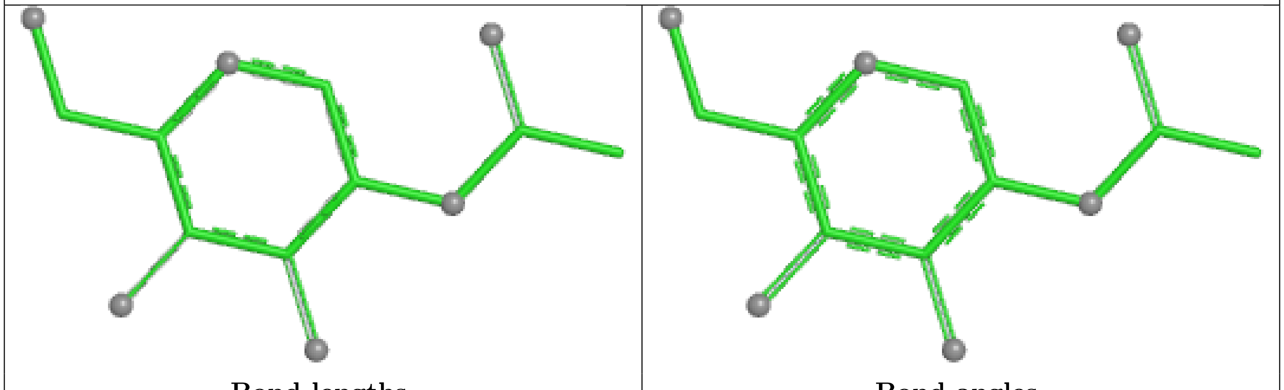


Bond lengths Bond angles

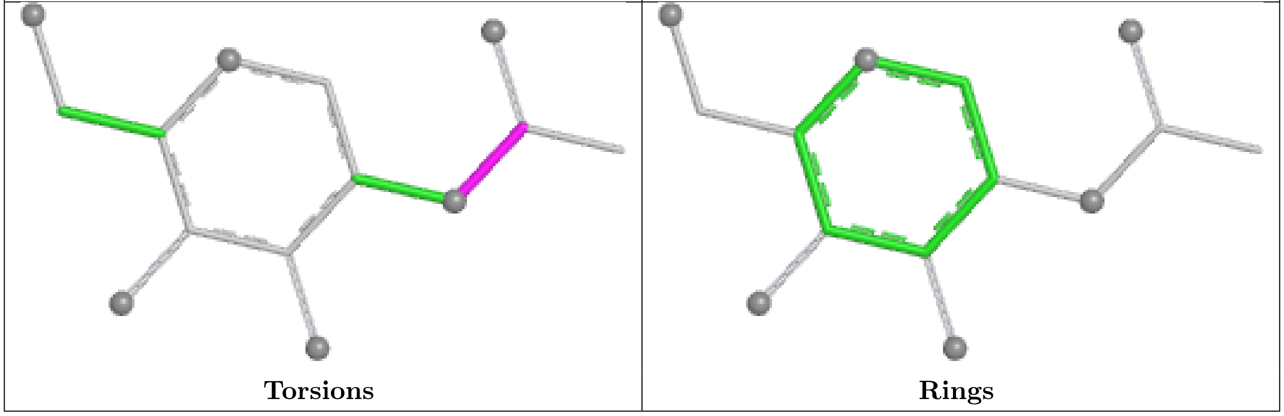


Torsions Rings

Ligand NAG C 1301

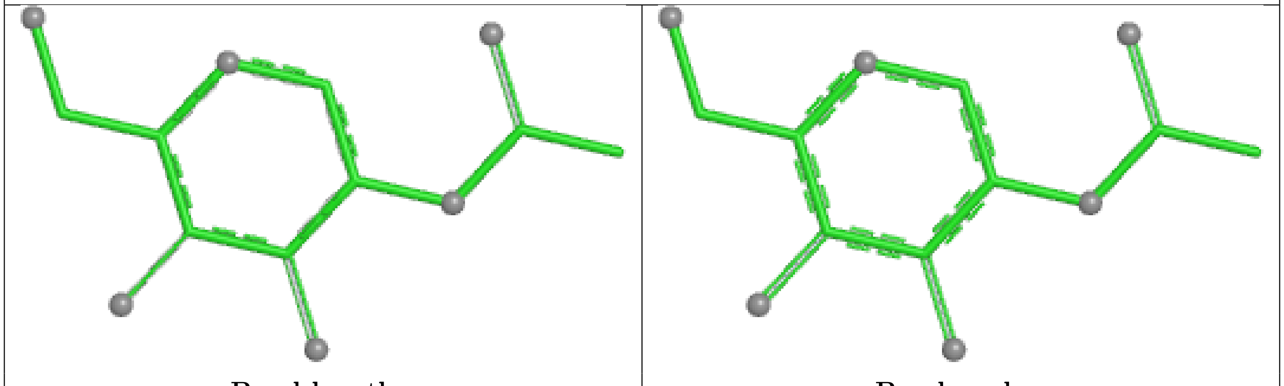


Bond lengths Bond angles



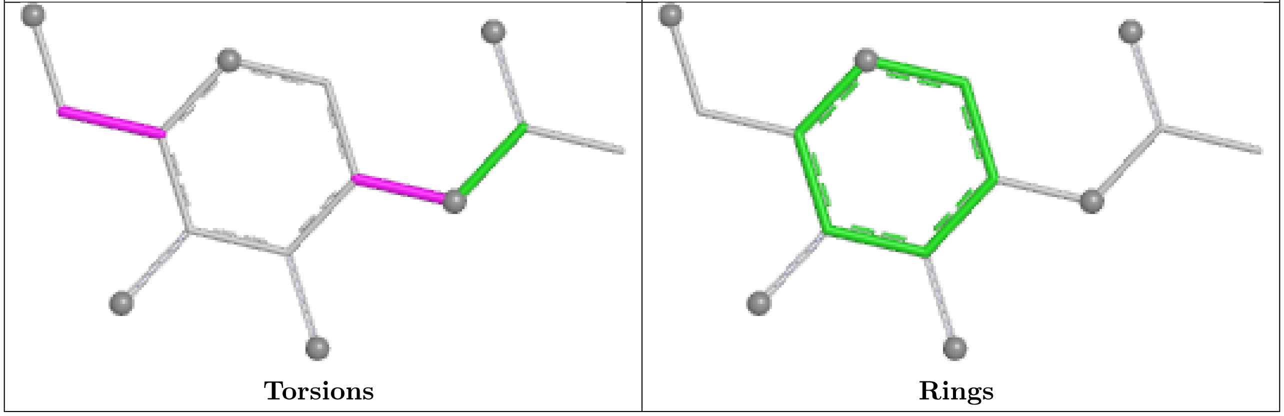
Torsions Rings

Ligand NAG B 1303



Bond lengths

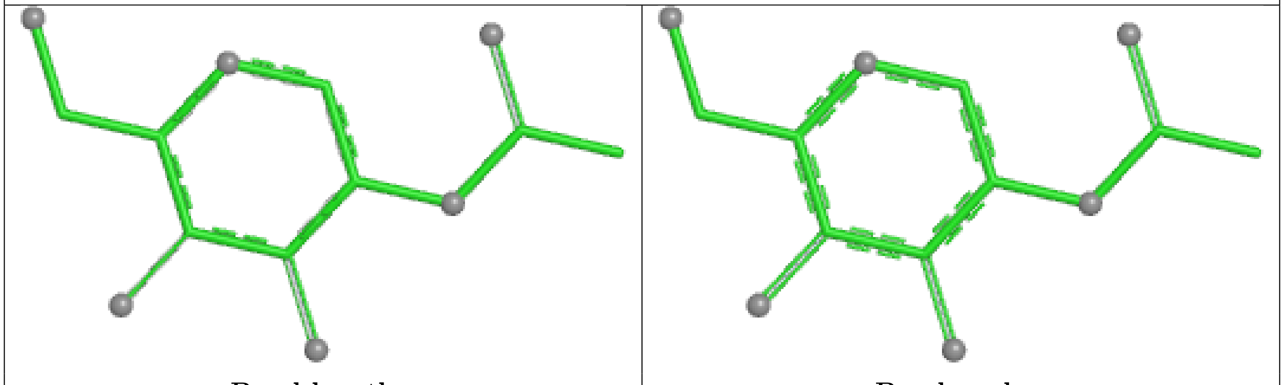
Bond angles



Torsions

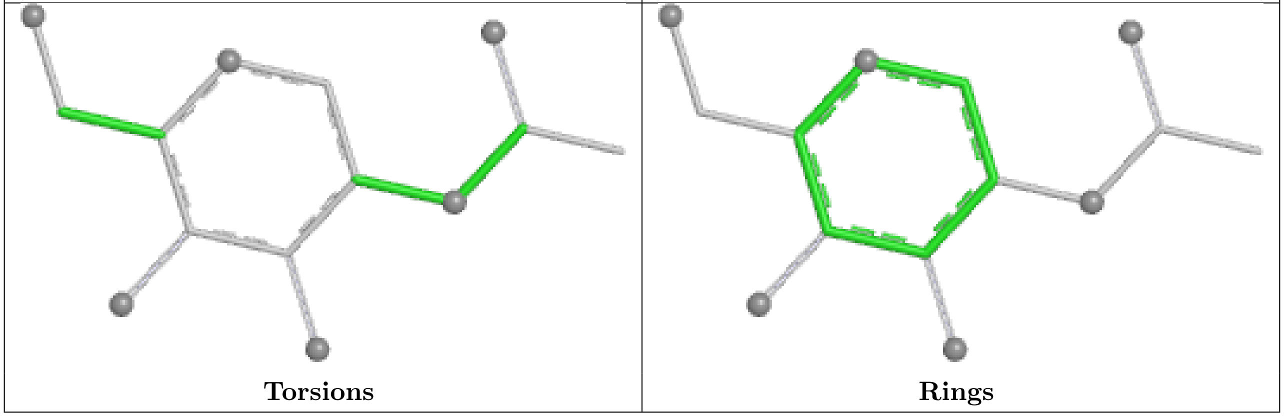
Rings

Ligand NAG C 1302



Bond lengths

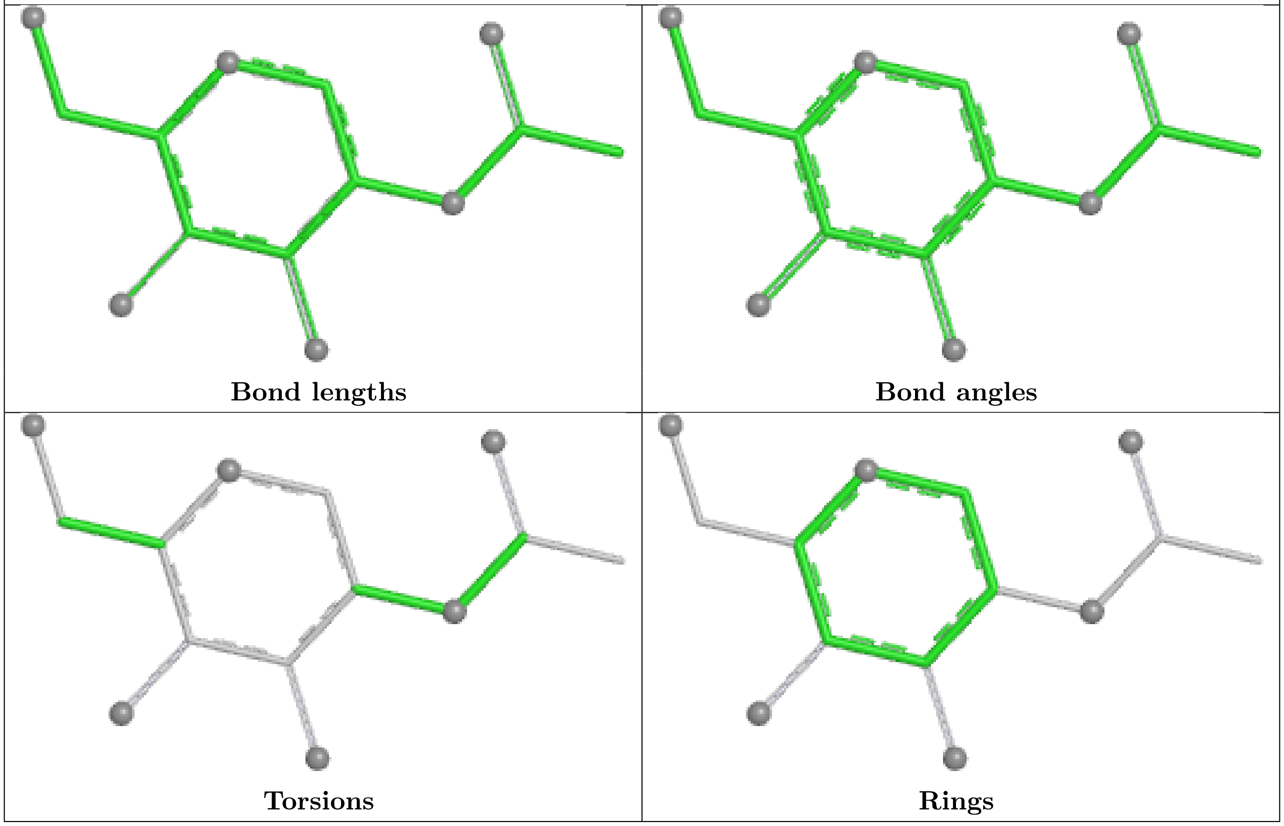
Bond angles



Torsions

Rings

Ligand NAG A 1301



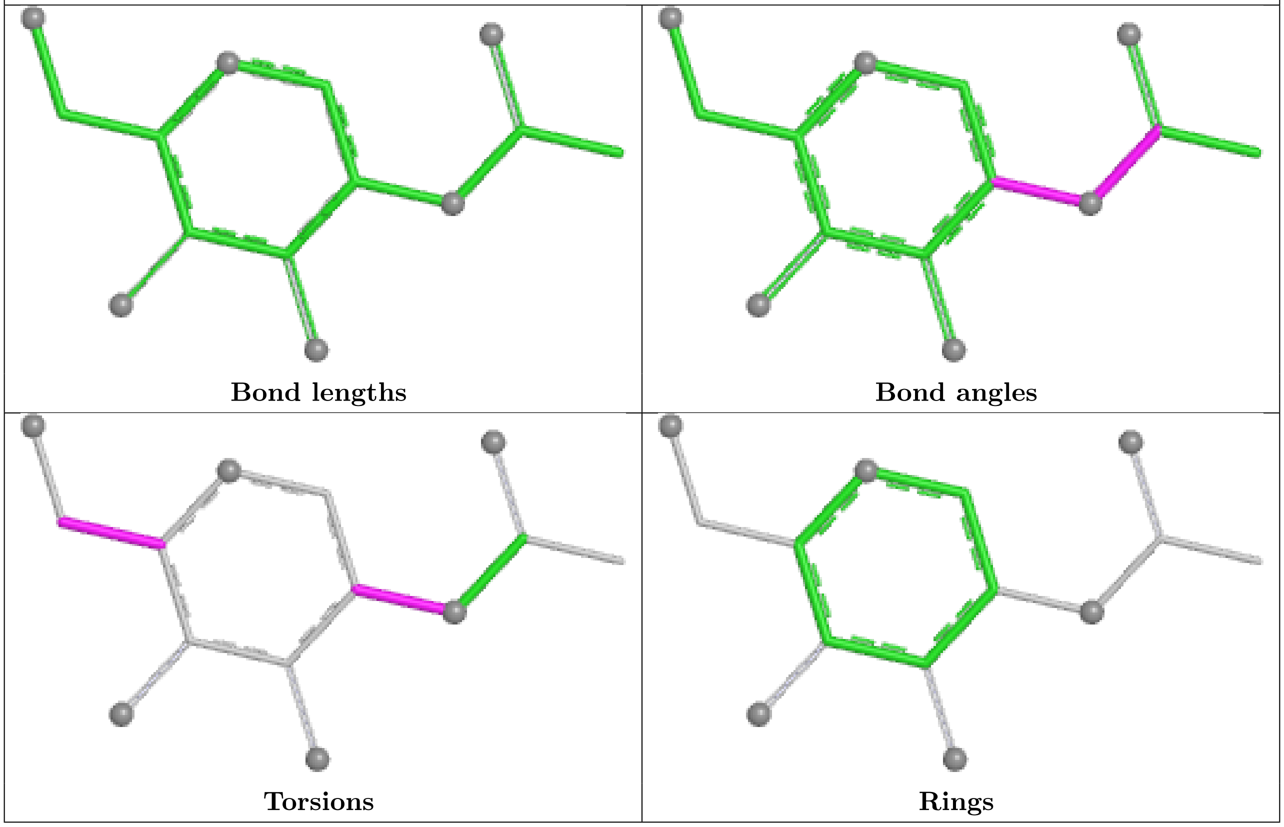
Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 1301



Bond lengths

Bond angles

Torsions

Rings

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.

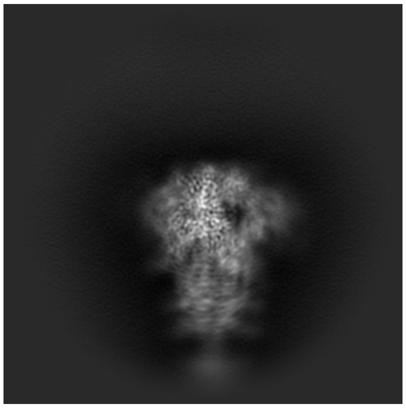
6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-73599. These allow visual inspection of the internal detail of the map and identification of artifacts.

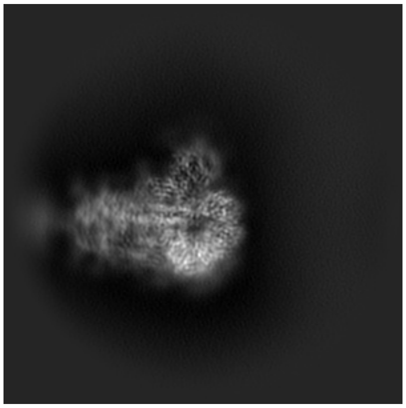
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections ⓘ

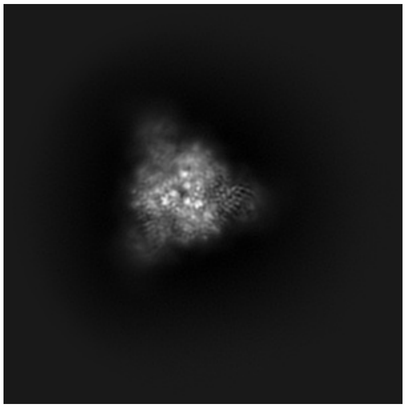
6.1.1 Primary map



X

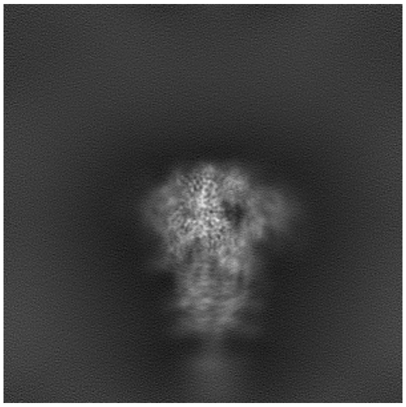


Y

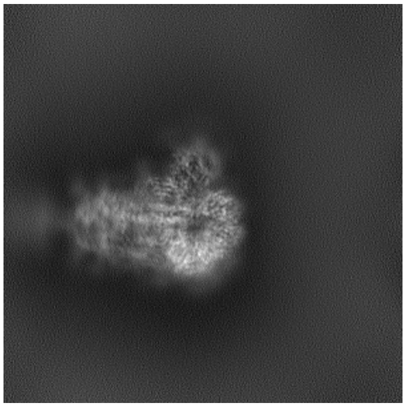


Z

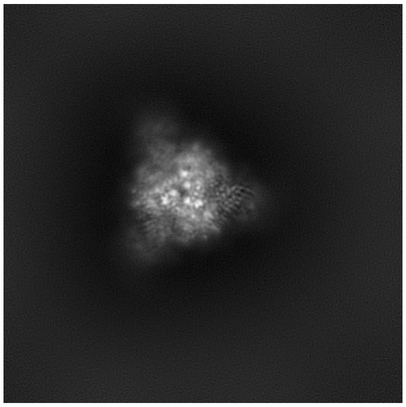
6.1.2 Raw map



X



Y

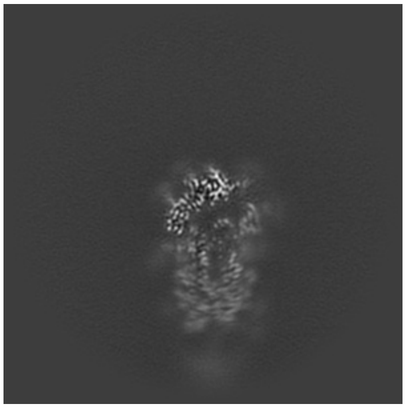


Z

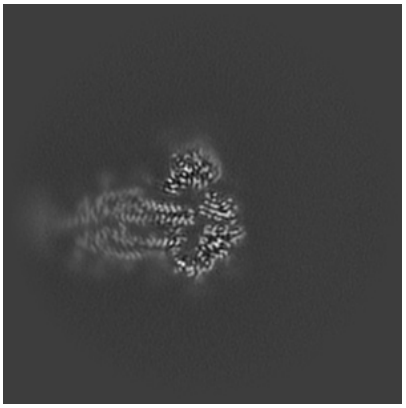
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

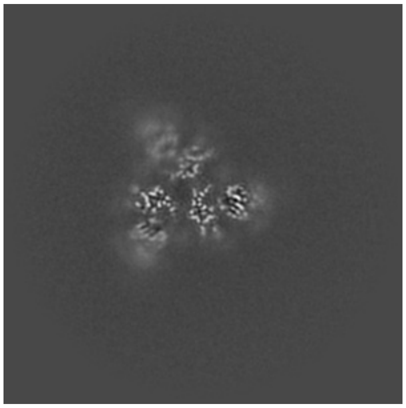
6.2.1 Primary map



X Index: 208

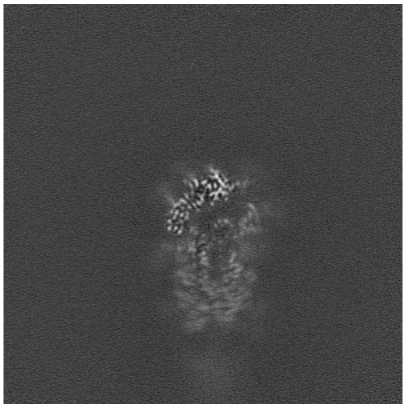


Y Index: 208

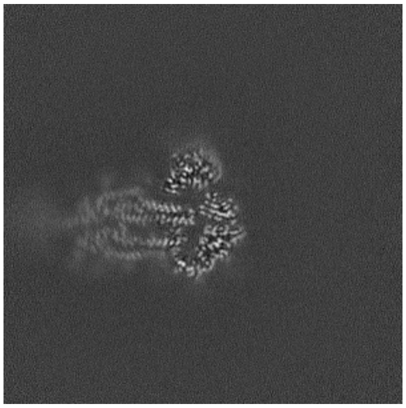


Z Index: 208

6.2.2 Raw map



X Index: 208



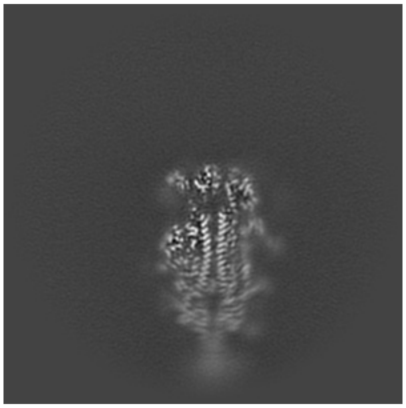
Y Index: 208

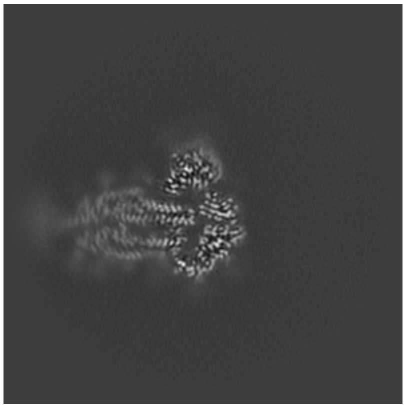
Z Index: 208

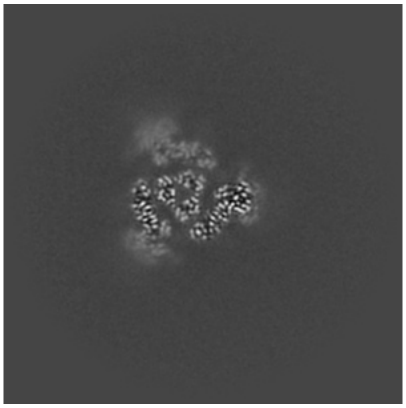
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

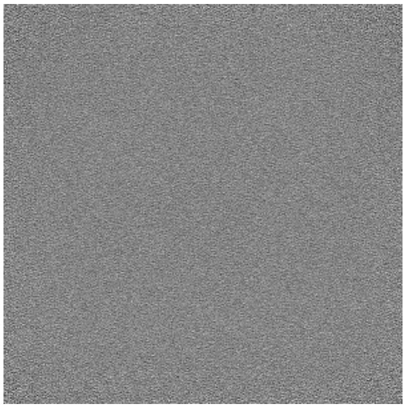
6.3.1 Primary map

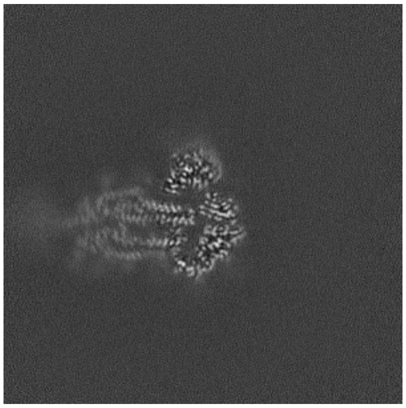

X Index: 192

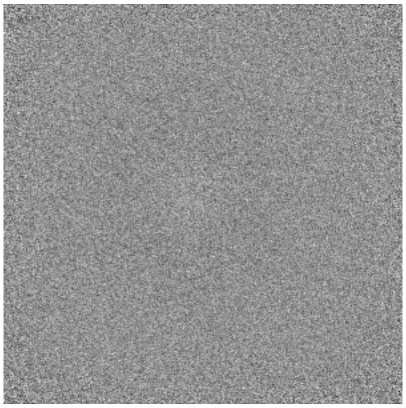

Y Index: 208


Z Index: 188

6.3.2 Raw map


X Index: 0

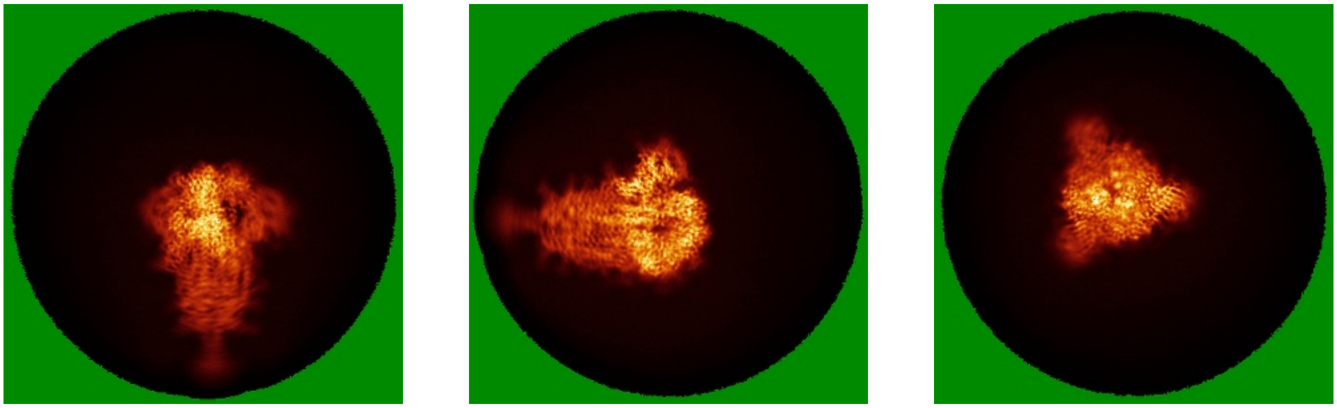

Y Index: 208


Z Index: 0

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

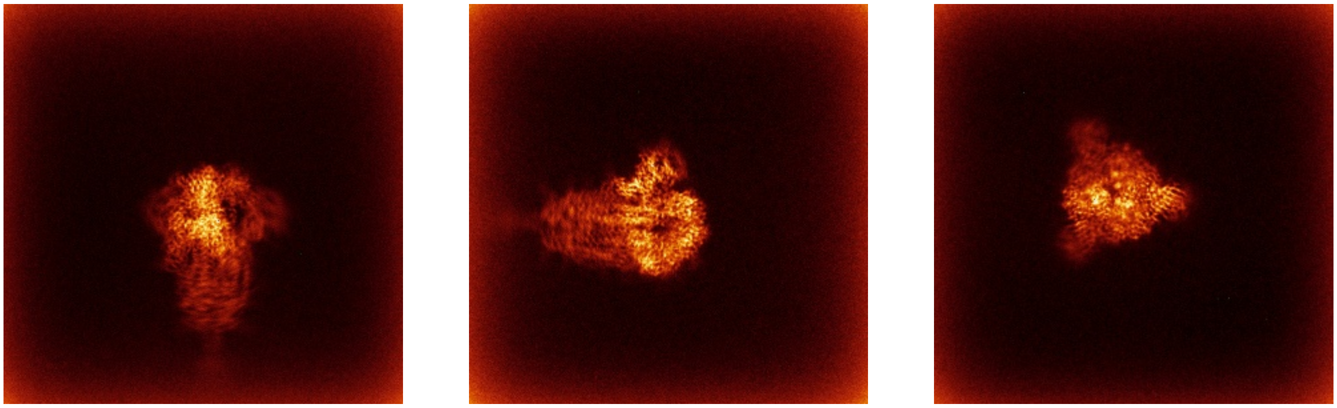
6.4 Orthogonal standard-deviation projections (False-color) ⓘ

6.4.1 Primary map



X Y Z

6.4.2 Raw map

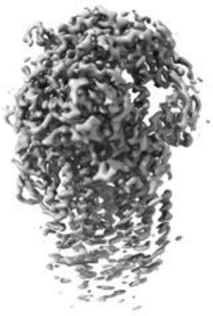


X Y Z

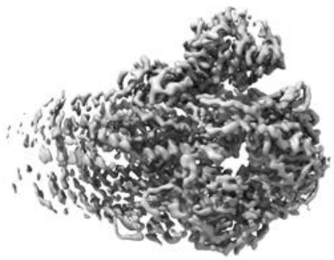
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

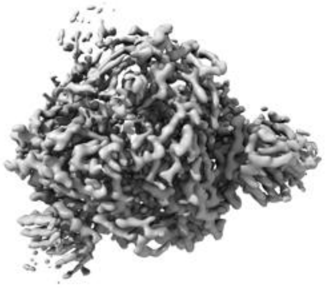
6.5.1 Primary map



X



Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.14. 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.

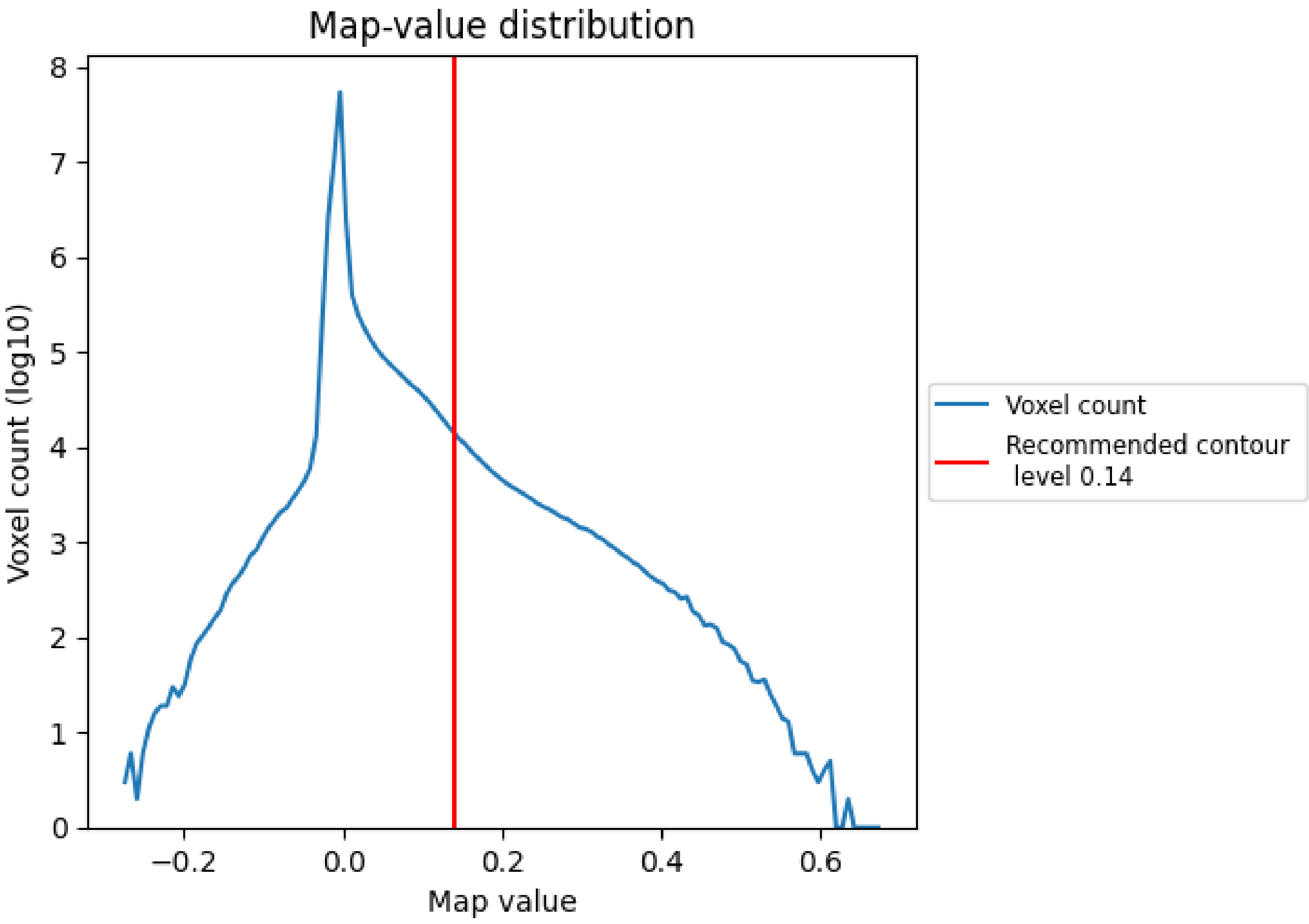
6.6 Mask visualisation ⓘ

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

7 Map analysis ⓘ

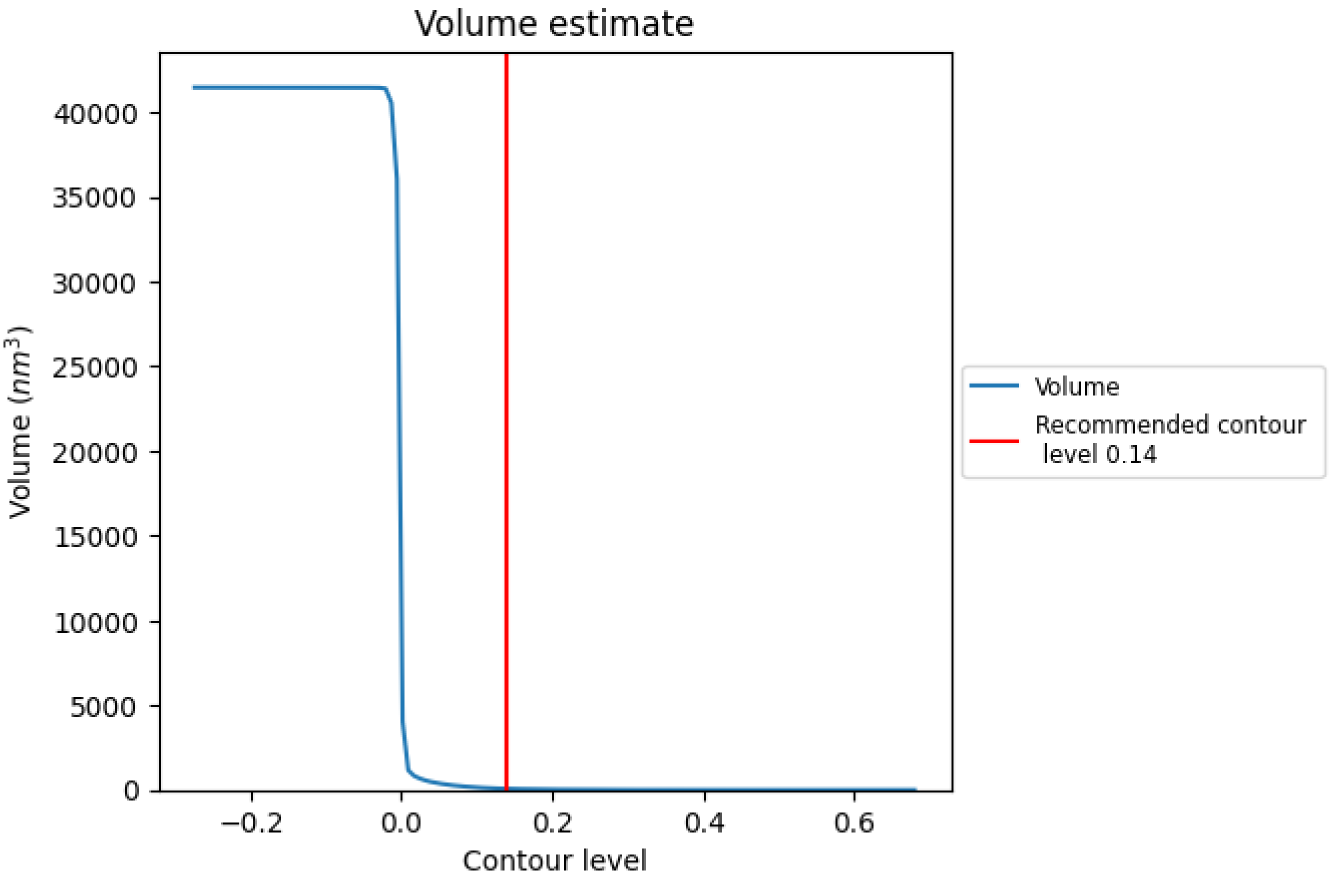
This section contains the results of statistical analysis of the map.

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.

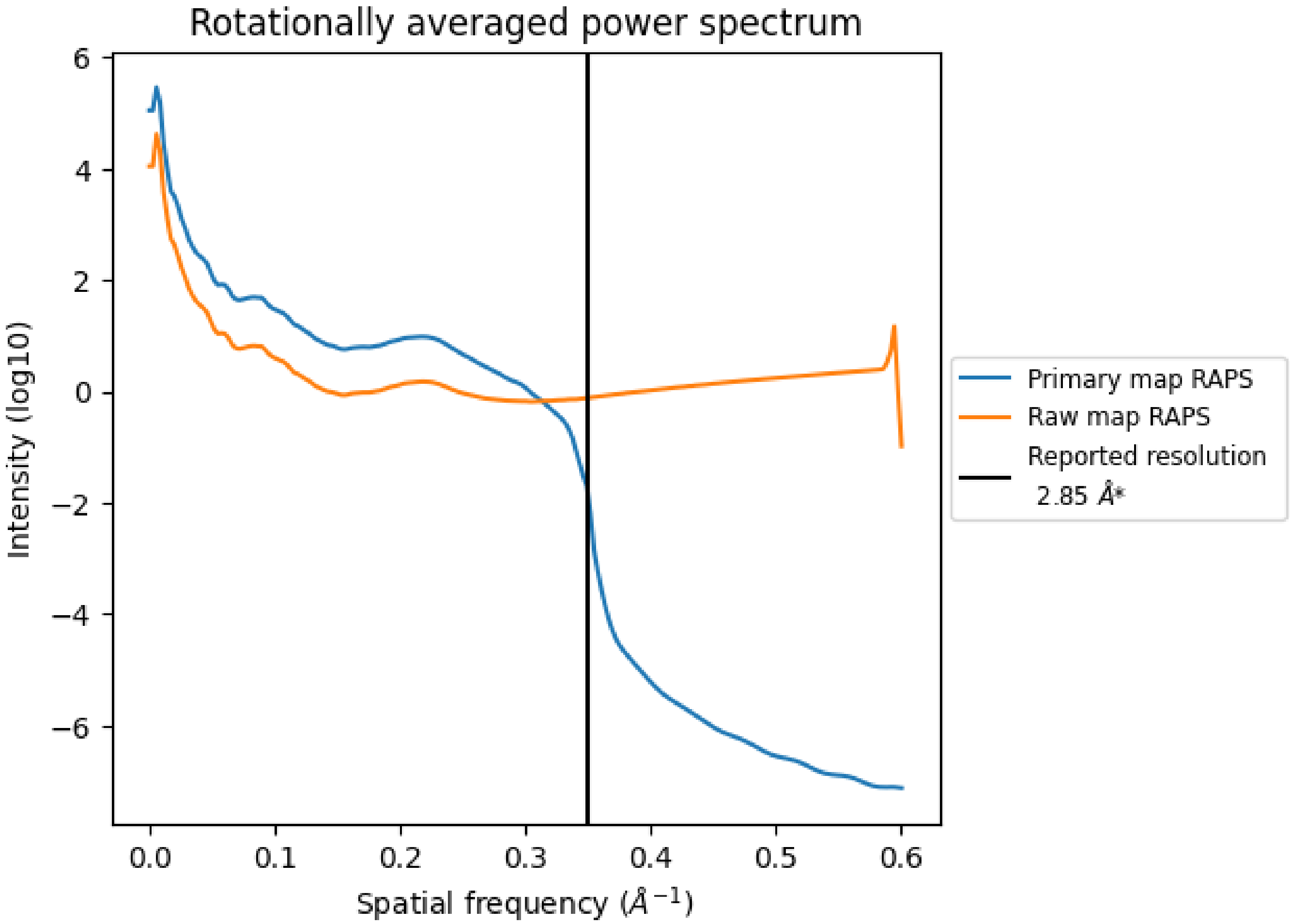
7.2 Volume estimate ⓘ



The volume at the recommended contour level is 70 nm^3; this corresponds to an approximate mass of 63 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 ⓘ

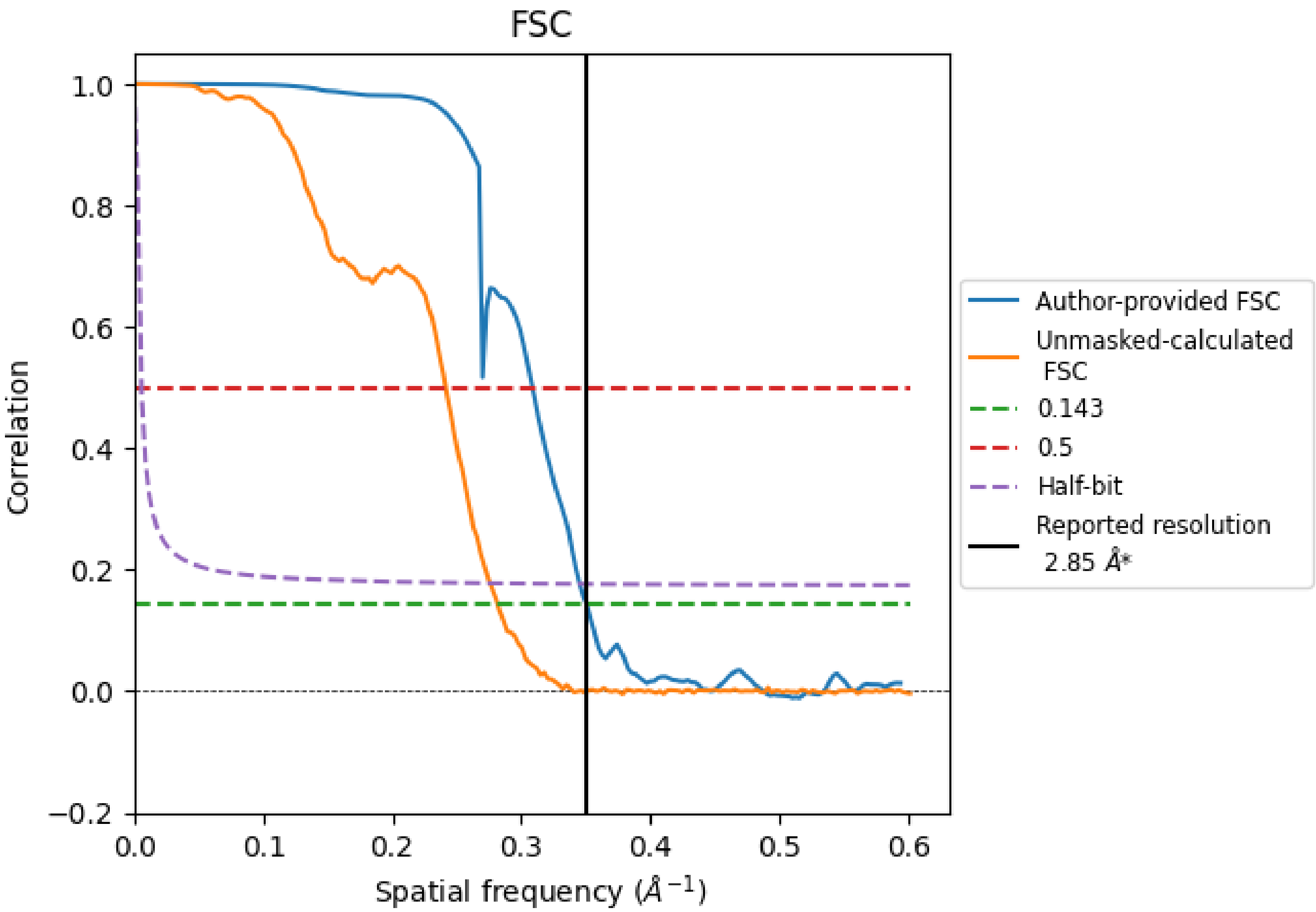


*Reported resolution corresponds to spatial frequency of 0.351 $Å^{-1}$

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 0.351 Å^{-1}

8.2 Resolution estimates (i)

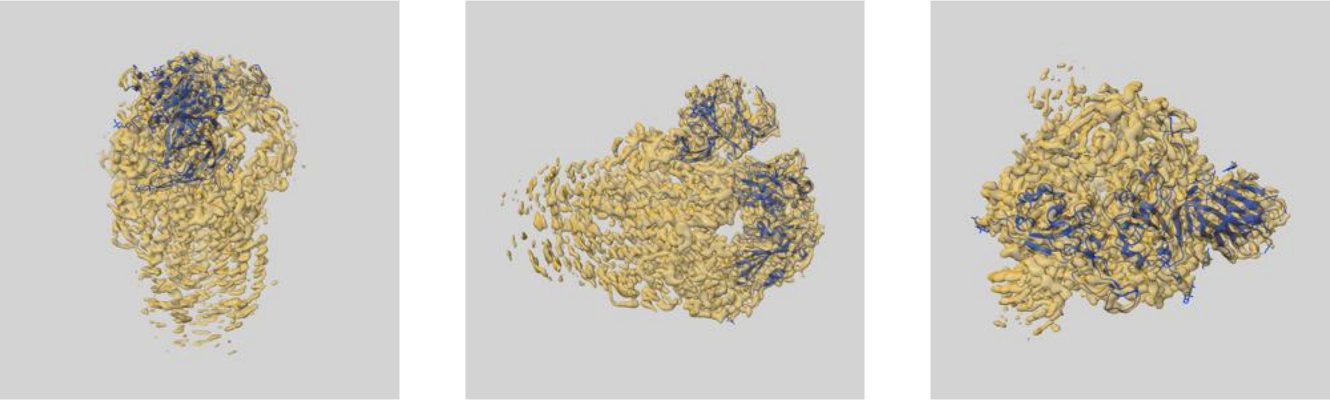
Resolution estimate (Å)	**Estimation criterion (FSC cut-off)**		
	0.143	0.5	Half-bit
Reported by author	2.85	-	-
Author-provided FSC curve	2.85	3.24	2.90
Unmasked-calculated*	3.55	4.14	3.63

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.55 differs from the reported value 2.85 by more than 10 %

9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-73599 and PDB model 9YX8. Per-residue inclusion information can be found in section 3 on page 5.

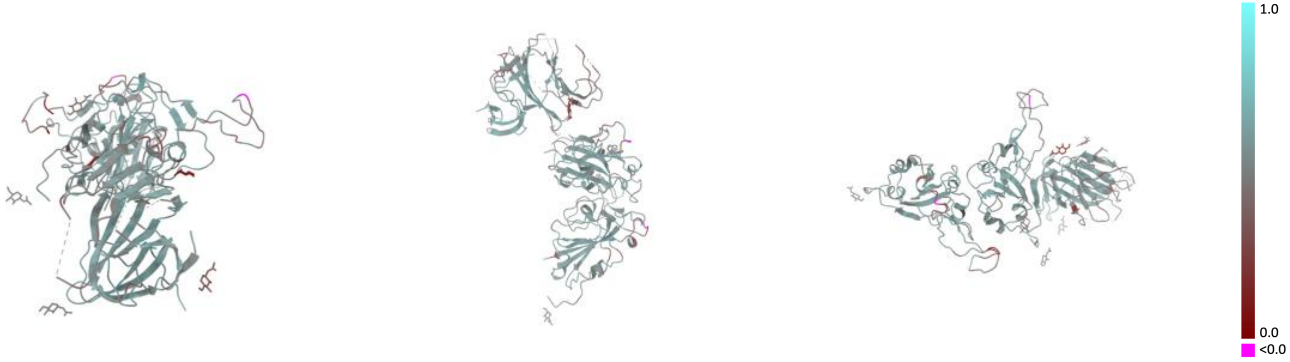
9.1 Map-model overlay



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.14 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.

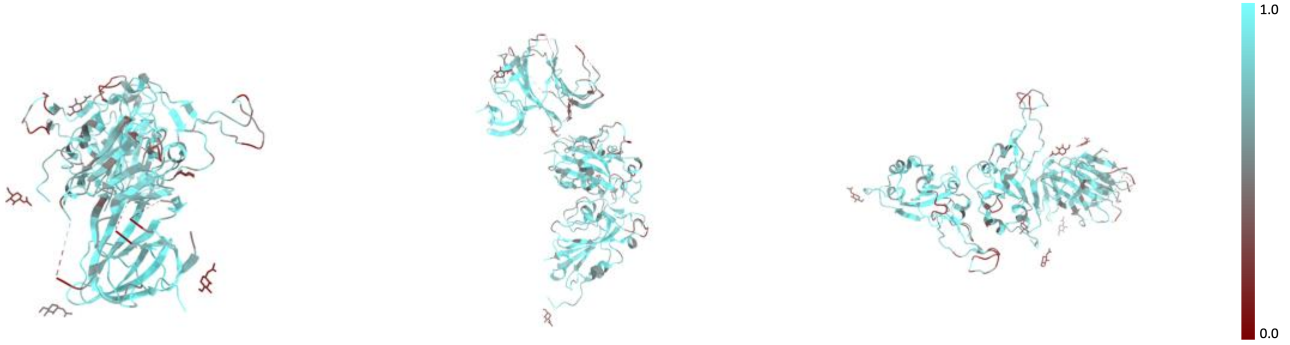
9.2 Q-score mapped to coordinate model (i)



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.

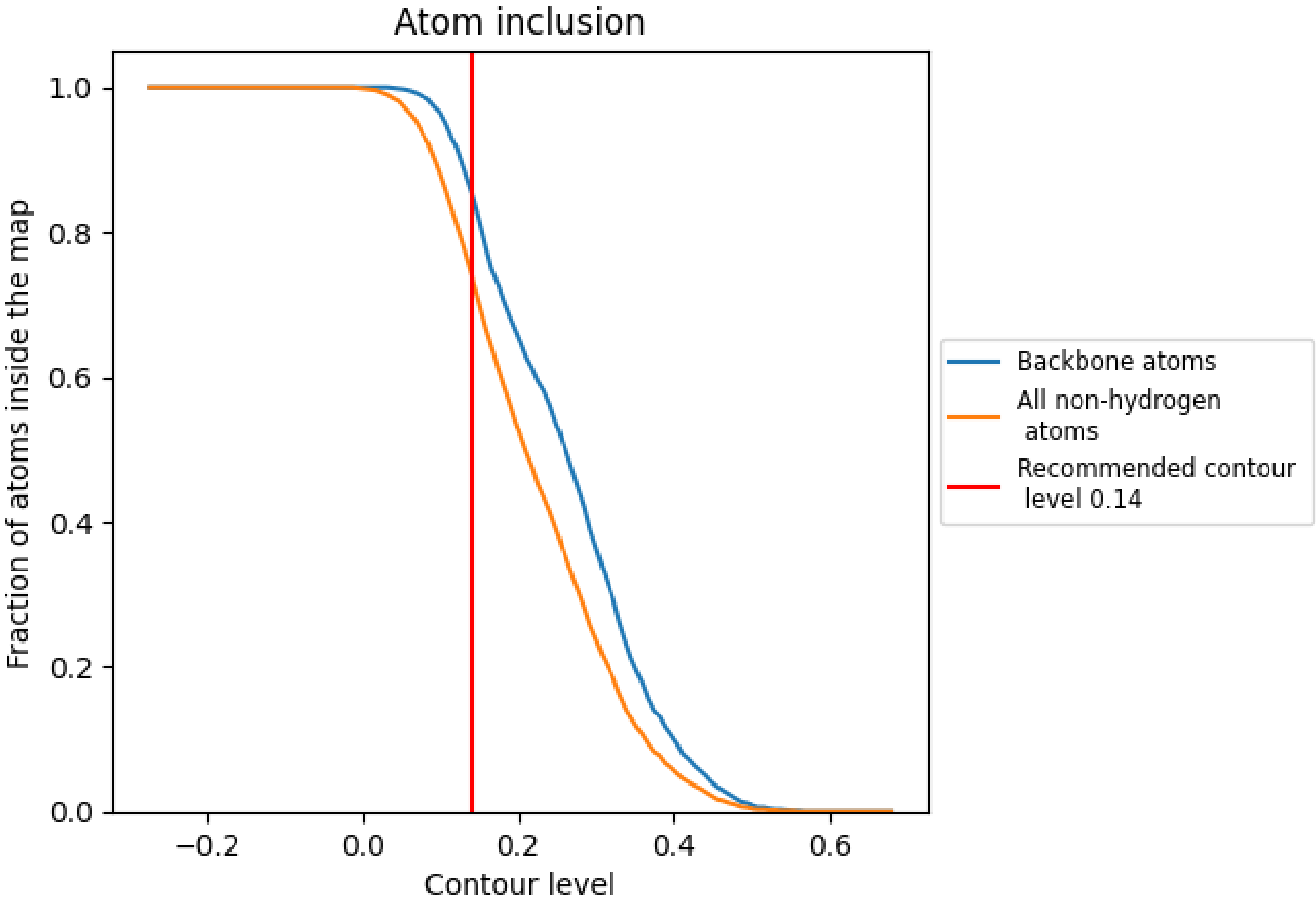
9.3 Atom inclusion mapped to coordinate model (i)



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 (0.14).

9.4 Atom inclusion ⓘ



At the recommended contour level, 86% of all backbone atoms, 74% 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 (0.14) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	▬ 0.7420	▬ 0.5320
A	▬ 0.7470	▬ 0.5240
B	▬ 0.7430	▬ 0.5310
C	▬ 0.7350	▬ 0.5400