



Full wwPDB EM Validation Report ⓘ

Mar 26, 2026 – 11:57 PM UTC

PDB ID : 6PPL / pdb_00006ppl
EMDB ID : EMD-20442
Title : Cryo-EM structure of human NatE complex (NatA/Naa50)
Authors : Deng, S.; Marmorstein, R.
Deposited on : 2019-07-08
Resolution : 3.02 Å (reported)
Based on initial models : 3TFY, 6C9M

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

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

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

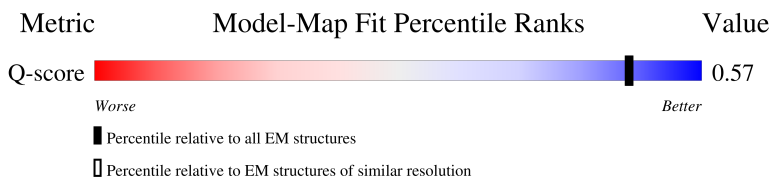
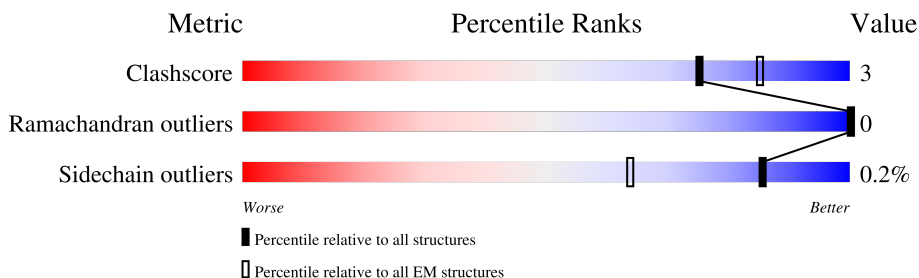
EMDB validation analysis : 0.0.1.dev132
Mogul : 2022.3.0, CSD as543be (2022)
MolProbity : 4-5-2 with Phenix2.0
Buster-report : wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics : 202505.v01 (Using data 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 3.02 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	13913 (2.52 - 3.52)

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	169	 82% 10% 8%
2	B	866	 70% 6% 23%
3	C	236	 64% 5% 32%

2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 8155 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 N-alpha-acetyltransferase 50.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	155	Total	C	N	O	S	0	0
			1260	808	221	225	6		

- Molecule 2 is a protein called N-alpha-acetyltransferase 15, NatA auxiliary subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	665	Total	C	N	O	S	0	0
			5470	3507	922	1007	34		

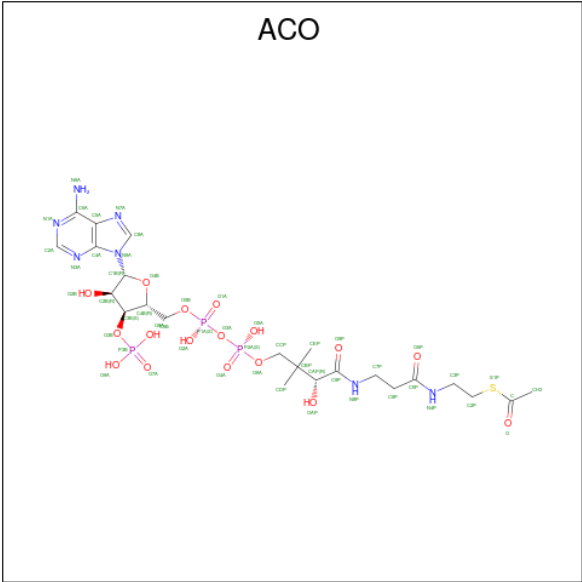
- Molecule 3 is a protein called N-alpha-acetyltransferase 10.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	161	Total	C	N	O	S	0	0
			1287	811	227	238	11		

There is a discrepancy between the modelled and reference sequences:

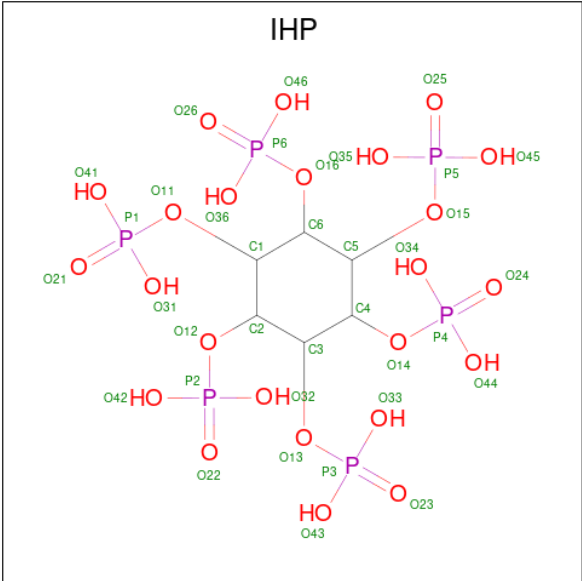
Chain	Residue	Modelled	Actual	Comment	Reference
C	0	ACE	-	acetylation	UNP P41227

- Molecule 4 is ACETYL COENZYME *A (CCD ID: ACO) (formula: C₂₃H₃₈N₇O₁₇P₃S) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						AltConf
4	A	1	Total	C	N	O	P	S	0
			51	23	7	17	3	1	
4	C	1	Total	C	N	O	P	S	0
			51	23	7	17	3	1	

- Molecule 5 is INOSITOL HEXAKISPHOSPHATE (CCD ID: IHP) (formula: $C_6H_{18}O_{24}P_6$) (labeled as "Ligand of Interest" by depositor).

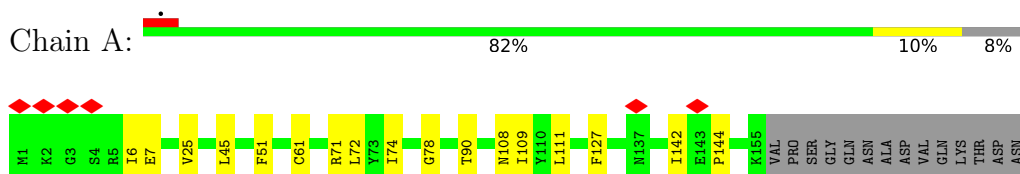


Mol	Chain	Residues	Atoms				AltConf
5	B	1	Total	C	O	P	0
			36	6	24	6	

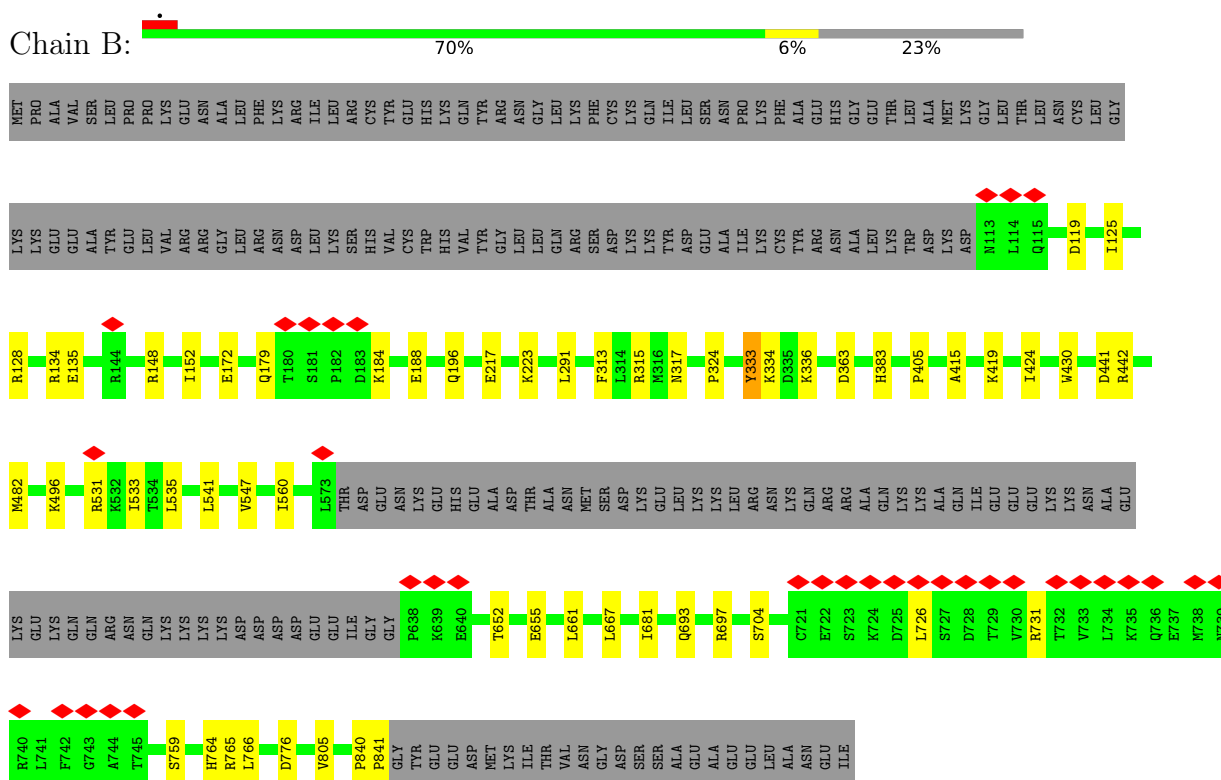
3 Residue-property plots

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: N-alpha-acetyltransferase 50



- Molecule 2: N-alpha-acetyltransferase 15, NatA auxiliary subunit



- Molecule 3: N-alpha-acetyltransferase 10





4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	353541	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 ($e^-/\text{\AA}^2$)	1.6	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.146	Depositor
Minimum map value	-0.077	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.015	Depositor
Map size (Å)	232.96, 232.96, 232.96	wwPDB
Map dimensions	280, 280, 280	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: IHP, ACO, ACE

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	0.22	0/1284	0.49	0/1728
2	B	0.23	0/5586	0.50	3/7535 (0.0%)
3	C	0.24	0/1313	0.47	0/1773
All	All	0.23	0/8183	0.49	3/11036 (0.0%)

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	336	LYS	N-CA-C	-6.56	105.43	113.50
2	B	291	LEU	CA-C-N	5.60	124.81	120.33
2	B	291	LEU	C-N-CA	5.60	124.81	120.33

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	1260	0	1281	10	0
2	B	5470	0	5497	35	0
3	C	1287	0	1244	10	0
4	A	51	0	31	2	0
4	C	51	0	34	1	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
5	B	36	0	6	0	0
All	All	8155	0	8093	50	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 3.

All (50) 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)
4:C:901:ACO:O4B	4:C:901:ACO:C1B	1.65	1.22
4:A:201:ACO:O4B	4:A:201:ACO:C1B	1.65	1.13
2:B:333:TYR:OH	2:B:383:HIS:ND1	1.92	0.77
1:A:71:ARG:HE	1:A:108:ASN:HD22	1.45	0.62
1:A:142:ILE:HG22	1:A:144:PRO:HD2	1.81	0.62
1:A:45:LEU:HB3	1:A:61:CYS:HB2	1.80	0.61
1:A:74:ILE:HG13	1:A:111:LEU:HB3	1.83	0.61
2:B:442:ARG:HB3	3:C:21:CYS:HA	1.83	0.61
2:B:726:LEU:O	2:B:731:ARG:NH2	2.35	0.59
2:B:541:LEU:HD22	3:C:36:LEU:HD11	1.87	0.56
2:B:333:TYR:HH	2:B:383:HIS:CE1	2.14	0.55
2:B:333:TYR:HH	2:B:383:HIS:HD1	0.54	0.54
2:B:496:LYS:HD3	2:B:560:ILE:HG23	1.90	0.54
2:B:693:GLN:HE21	2:B:697:ARG:HH12	1.56	0.53
2:B:217:GLU:O	2:B:223:LYS:NZ	2.43	0.52
2:B:148:ARG:HD2	2:B:533:ILE:HD11	1.92	0.51
2:B:313:PHE:O	2:B:317:ASN:ND2	2.43	0.51
2:B:148:ARG:NH2	2:B:531:ARG:O	2.43	0.51
2:B:324:PRO:HG2	3:C:84:LEU:HD13	1.92	0.50
2:B:661:LEU:HD22	2:B:681:ILE:HD12	1.92	0.50
2:B:315:ARG:NH2	2:B:363:ASP:OD2	2.46	0.49
2:B:134:ARG:NH2	2:B:135:GLU:OE1	2.46	0.49
2:B:759:SER:HB2	2:B:765:ARG:HH11	1.78	0.48
1:A:90:THR:HG23	1:A:127:PHE:HZ	1.78	0.48
2:B:125:ILE:O	2:B:128:ARG:NH1	2.41	0.48
2:B:704:SER:O	2:B:764:HIS:NE2	2.38	0.48
2:B:419:LYS:HG3	2:B:424:ILE:HD13	1.96	0.48
2:B:152:ILE:HD12	2:B:535:LEU:HD21	1.95	0.47
2:B:652:THR:HB	2:B:655:GLU:HB2	1.97	0.47
2:B:119:ASP:OD1	2:B:119:ASP:N	2.46	0.47
1:A:78:GLY:HA3	4:A:201:ACO:H62	1.95	0.47
1:A:25:VAL:HG21	2:B:405:PRO:HG3	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:148:ARG:NH1	2:B:188:GLU:OE1	2.49	0.46
3:C:61:GLU:OE1	3:C:69:HIS:NE2	2.41	0.46
3:C:140:ASP:OD1	3:C:140:ASP:N	2.47	0.46
2:B:441:ASP:OD2	3:C:79:ARG:NH1	2.41	0.46
1:A:72:LEU:HB3	1:A:109:ILE:HD13	1.98	0.45
3:C:60:MET:HE3	3:C:60:MET:HB3	1.87	0.45
2:B:776:ASP:N	2:B:776:ASP:OD1	2.49	0.45
2:B:179:GLN:HA	2:B:184:LYS:HE2	1.99	0.45
1:A:7:GLU:OE2	3:C:116:ARG:NH2	2.50	0.44
2:B:172:GLU:OE1	2:B:196:GLN:NE2	2.50	0.43
2:B:766:LEU:HD13	2:B:805:VAL:HG22	1.99	0.43
2:B:415:ALA:HB2	2:B:430:TRP:HB2	2.00	0.43
2:B:840:PRO:HA	2:B:841:PRO:HD3	1.91	0.43
2:B:333:TYR:OH	2:B:383:HIS:CE1	2.67	0.42
2:B:482:MET:HE2	3:C:27:GLN:HE21	1.85	0.42
1:A:6:ILE:HG12	1:A:51:PHE:HD1	1.85	0.41
2:B:547:VAL:HG12	2:B:667:LEU:HD22	2.01	0.41
3:C:79:ARG:HD2	3:C:82:ARG:HD2	2.04	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	153/169 (90%)	150 (98%)	3 (2%)	0	100	100
2	B	661/866 (76%)	642 (97%)	19 (3%)	0	100	100
3	C	159/236 (67%)	155 (98%)	4 (2%)	0	100	100
All	All	973/1271 (77%)	947 (97%)	26 (3%)	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	137/150 (91%)	137 (100%)	0	100	100
2	B	593/769 (77%)	591 (100%)	2 (0%)	86	90
3	C	134/202 (66%)	134 (100%)	0	100	100
All	All	864/1121 (77%)	862 (100%)	2 (0%)	85	91

All (2) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	333	TYR
2	B	334	LYS

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

Mol	Chain	Res	Type
1	A	52	ASN
2	B	113	ASN
2	B	142	GLN
2	B	382	GLN
2	B	445	ASN
2	B	456	ASN
2	B	693	GLN
2	B	705	HIS
2	B	749	ASN
3	C	27	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

3 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
4	ACO	C	901	-	51,53,53	3.31	18 (35%)	73,79,79	1.85	13 (17%)
5	IHP	B	901	-	36,36,36	1.55	6 (16%)	60,60,60	1.12	4 (6%)
4	ACO	A	201	-	51,53,53	3.42	19 (37%)	73,79,79	1.84	15 (20%)

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
4	ACO	C	901	-	-	22/51/67/67	0/3/3/3
5	IHP	B	901	-	-	3/30/54/54	0/1/1/1
4	ACO	A	201	-	-	11/51/67/67	0/3/3/3

All (43) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	A	201	ACO	P2A-O3A	12.67	1.73	1.59
4	C	901	ACO	P2A-O3A	11.56	1.72	1.59
4	A	201	ACO	O4B-C1B	10.35	1.65	1.42
4	C	901	ACO	O4B-C1B	10.32	1.65	1.42
4	C	901	ACO	C5P-N4P	7.15	1.50	1.33
4	A	201	ACO	C5P-N4P	6.98	1.50	1.33
4	C	901	ACO	O4B-C4B	-6.69	1.30	1.45
4	A	201	ACO	O4B-C4B	-6.46	1.30	1.45

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	901	ACO	C2B-C1B	-6.14	1.34	1.53
4	A	201	ACO	C2B-C1B	-6.09	1.34	1.53
4	A	201	ACO	P1A-O3A	5.67	1.65	1.59
4	A	201	ACO	C9P-N8P	5.37	1.46	1.33
4	C	901	ACO	C9P-N8P	5.21	1.45	1.33
4	C	901	ACO	P1A-O3A	4.93	1.64	1.59
4	A	201	ACO	C6A-N6A	4.89	1.46	1.34
4	C	901	ACO	C6A-N6A	4.83	1.46	1.34
4	C	901	ACO	O3B-C3B	-3.61	1.31	1.44
5	B	901	IHP	P4-O14	3.50	1.65	1.59
4	A	201	ACO	O3B-C3B	-3.44	1.32	1.44
5	B	901	IHP	P6-O16	3.35	1.65	1.59
5	B	901	IHP	P1-O11	3.26	1.65	1.59
4	A	201	ACO	C6P-C5P	3.22	1.57	1.51
5	B	901	IHP	P2-O12	3.21	1.65	1.59
5	B	901	IHP	P3-O13	3.18	1.65	1.59
4	C	901	ACO	C6P-C5P	3.15	1.57	1.51
4	A	201	ACO	P3B-O3B	3.03	1.64	1.59
4	A	201	ACO	O5P-C5P	-2.97	1.17	1.23
5	B	901	IHP	P5-O15	2.96	1.64	1.59
4	A	201	ACO	P2A-O6A	2.94	1.70	1.59
4	A	201	ACO	C3B-C4B	2.85	1.60	1.52
4	C	901	ACO	P2A-O6A	2.77	1.70	1.59
4	C	901	ACO	P3B-O3B	2.58	1.64	1.59
4	C	901	ACO	C5A-C4A	-2.50	1.34	1.39
4	C	901	ACO	O5P-C5P	-2.50	1.18	1.23
4	C	901	ACO	C3B-C4B	2.48	1.59	1.52
4	C	901	ACO	OAP-CAP	-2.44	1.38	1.42
4	C	901	ACO	C5A-N7A	-2.39	1.34	1.39
4	A	201	ACO	C5A-C4A	-2.36	1.34	1.39
4	A	201	ACO	OAP-CAP	-2.36	1.38	1.42
4	A	201	ACO	C5A-N7A	-2.28	1.34	1.39
4	A	201	ACO	P1A-O5B	2.23	1.68	1.59
4	A	201	ACO	C2A-N1A	2.13	1.37	1.33
4	C	901	ACO	P1A-O5B	2.03	1.67	1.59

All (32) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	201	ACO	N6A-C6A-N1A	-6.26	104.44	118.38
4	C	901	ACO	N6A-C6A-N1A	-6.24	104.47	118.38
4	C	901	ACO	N3A-C2A-N1A	-6.01	119.49	128.58

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	A	201	ACO	N3A-C2A-N1A	-5.78	119.83	128.58
4	C	901	ACO	C5A-C4A-N3A	-4.98	119.85	126.72
4	A	201	ACO	C5A-C6A-N6A	4.83	135.25	123.29
4	C	901	ACO	C5A-C6A-N6A	4.70	134.91	123.29
4	A	201	ACO	C5A-C4A-N3A	-4.64	120.33	126.72
4	C	901	ACO	N9A-C8A-N7A	-4.15	108.05	113.94
4	A	201	ACO	N9A-C8A-N7A	-4.00	108.26	113.94
5	B	901	IHP	C3-C2-C1	3.89	118.97	110.43
4	C	901	ACO	C7P-N8P-C9P	-3.64	116.00	122.55
4	C	901	ACO	C2A-N3A-C4A	3.62	120.68	111.83
4	A	201	ACO	C2A-N3A-C4A	3.41	120.16	111.83
5	B	901	IHP	C6-C1-C2	3.37	117.82	110.43
4	A	201	ACO	C3B-C2B-C1B	3.12	106.76	99.89
4	C	901	ACO	N3A-C4A-N9A	3.12	132.48	127.17
5	B	901	IHP	C4-C3-C2	2.85	116.68	110.43
5	B	901	IHP	P5-O15-C5	-2.85	115.82	123.43
4	C	901	ACO	C5A-N7A-C8A	2.85	107.92	103.45
4	C	901	ACO	CAP-C9P-N8P	2.81	121.81	116.48
4	A	201	ACO	C5A-N7A-C8A	2.74	107.76	103.45
4	A	201	ACO	N3A-C4A-N9A	2.58	131.55	127.17
4	C	901	ACO	C3B-C2B-C1B	2.44	105.27	99.89
4	C	901	ACO	O9P-C9P-N8P	-2.21	118.30	122.98
4	C	901	ACO	C4A-N9A-C8A	2.21	108.06	105.74
4	A	201	ACO	CAP-C9P-N8P	2.20	120.65	116.48
4	A	201	ACO	C4A-C5A-N7A	-2.18	108.09	110.58
4	A	201	ACO	C5A-C4A-N9A	2.12	108.12	105.81
4	A	201	ACO	O9P-C9P-N8P	-2.03	118.69	122.98
4	A	201	ACO	C2P-C3P-N4P	-2.02	108.20	112.41
4	A	201	ACO	C6P-C5P-N4P	2.01	120.00	116.34

There are no chirality outliers.

All (36) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	201	ACO	CDP-CBP-CCP-O6A
4	A	201	ACO	CEP-CBP-CCP-O6A
4	A	201	ACO	CAP-CBP-CCP-O6A
4	A	201	ACO	CAP-C9P-N8P-C7P
4	A	201	ACO	C5P-C6P-C7P-N8P
4	A	201	ACO	C3P-C2P-S1P-C
4	C	901	ACO	O4B-C4B-C5B-O5B
4	C	901	ACO	CCP-O6A-P2A-O4A

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Mol	Chain	Res	Type	Atoms
4	C	901	ACO	CDP-CBP-CCP-O6A
4	C	901	ACO	CEP-CBP-CCP-O6A
4	C	901	ACO	CAP-CBP-CCP-O6A
4	C	901	ACO	C9P-CAP-CBP-CCP
4	C	901	ACO	C9P-CAP-CBP-CDP
4	C	901	ACO	O-C-S1P-C2P
4	C	901	ACO	CH3-C-S1P-C2P
4	A	201	ACO	O9P-C9P-N8P-C7P
4	C	901	ACO	C3B-C4B-C5B-O5B
4	A	201	ACO	O4B-C4B-C5B-O5B
5	B	901	IHP	C5-O15-P5-O25
4	C	901	ACO	OAP-CAP-CBP-CDP
4	C	901	ACO	OAP-CAP-CBP-CEP
4	C	901	ACO	C9P-CAP-CBP-CEP
4	A	201	ACO	CCP-O6A-P2A-O4A
4	C	901	ACO	CCP-O6A-P2A-O3A
4	C	901	ACO	CCP-O6A-P2A-O5A
4	C	901	ACO	OAP-CAP-CBP-CCP
4	C	901	ACO	O5P-C5P-C6P-C7P
4	C	901	ACO	P2A-O3A-P1A-O1A
4	C	901	ACO	P1A-O3A-P2A-O5A
4	C	901	ACO	N4P-C5P-C6P-C7P
5	B	901	IHP	C1-O11-P1-O31
5	B	901	IHP	C6-O16-P6-O36
4	A	201	ACO	CBP-CCP-O6A-P2A
4	A	201	ACO	N8P-C9P-CAP-OAP
4	C	901	ACO	N8P-C9P-CAP-OAP
4	C	901	ACO	P2A-O3A-P1A-O2A

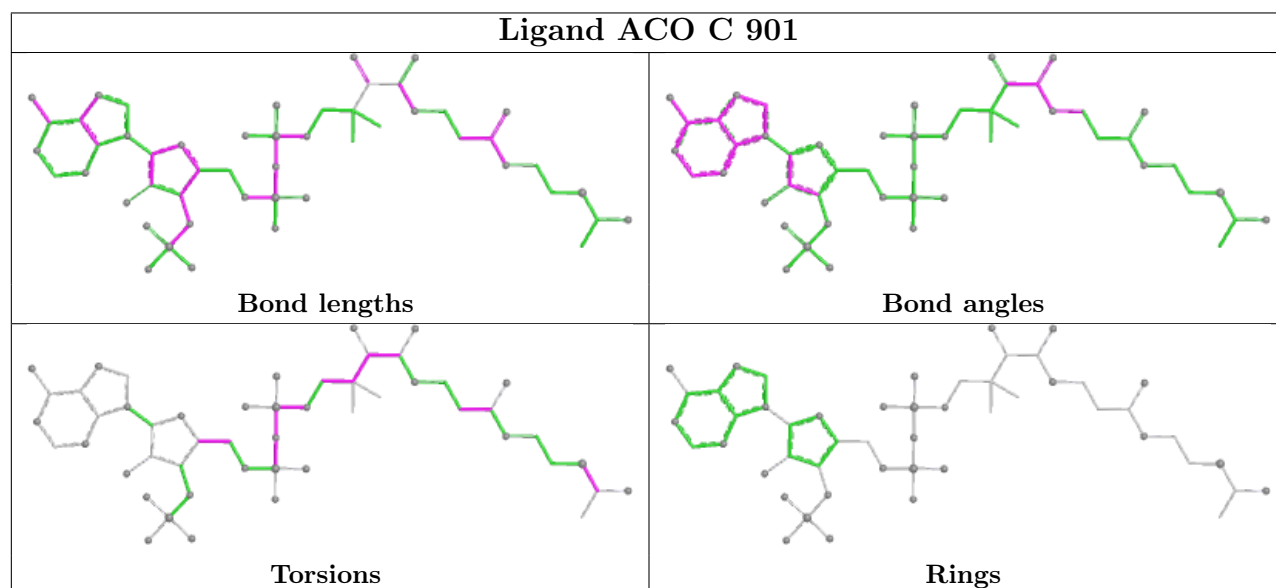
There are no ring outliers.

2 monomers are involved in 3 short contacts:

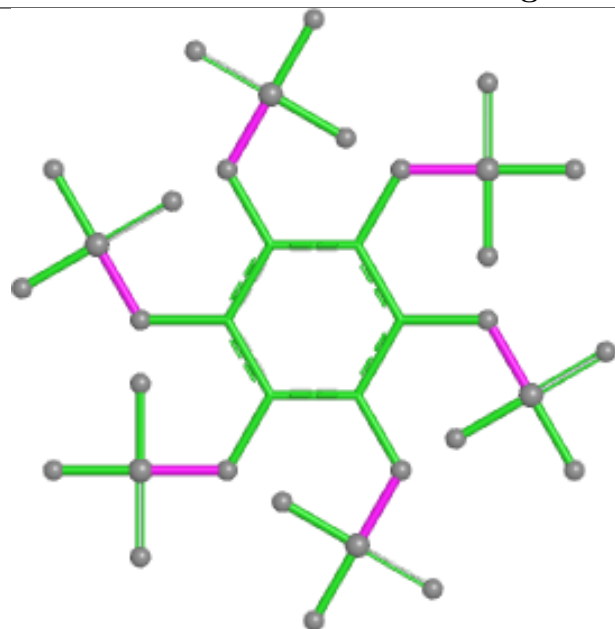
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	901	ACO	1	0
4	A	201	ACO	2	0

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 than 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

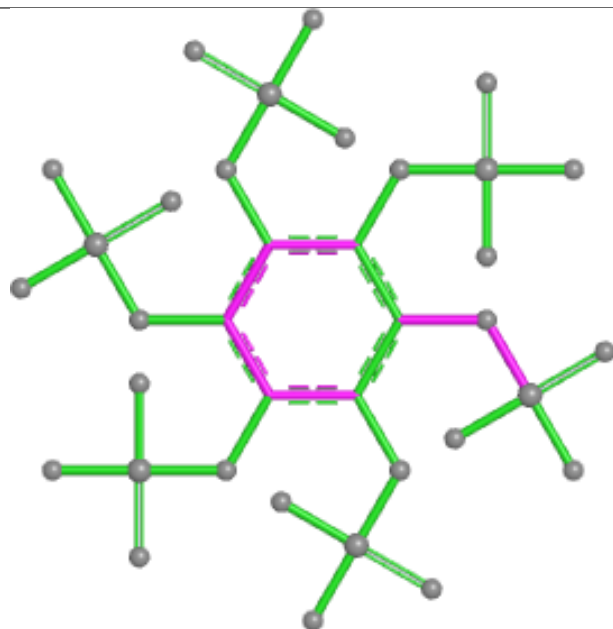
highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified 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.



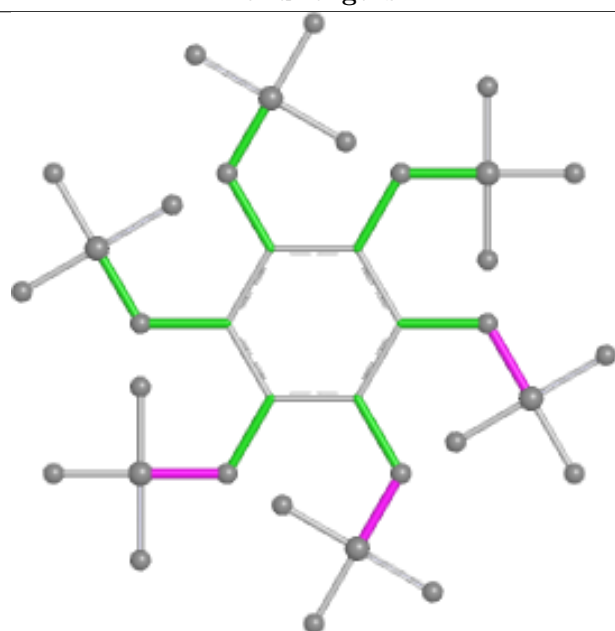
Ligand IHP B 901



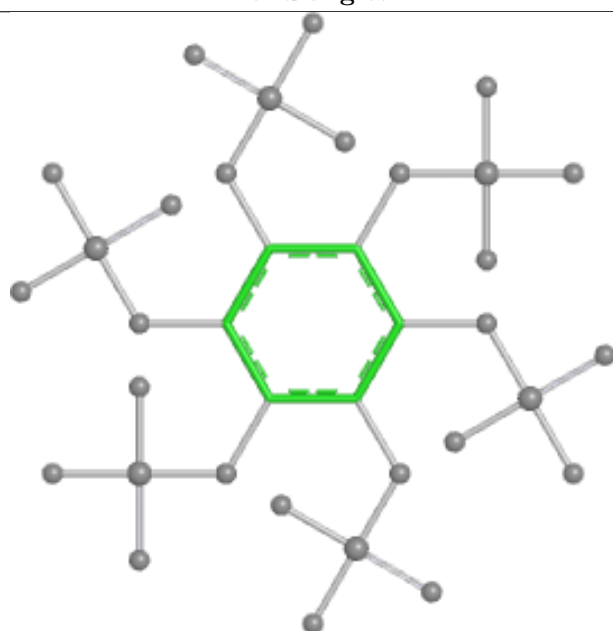
Bond lengths



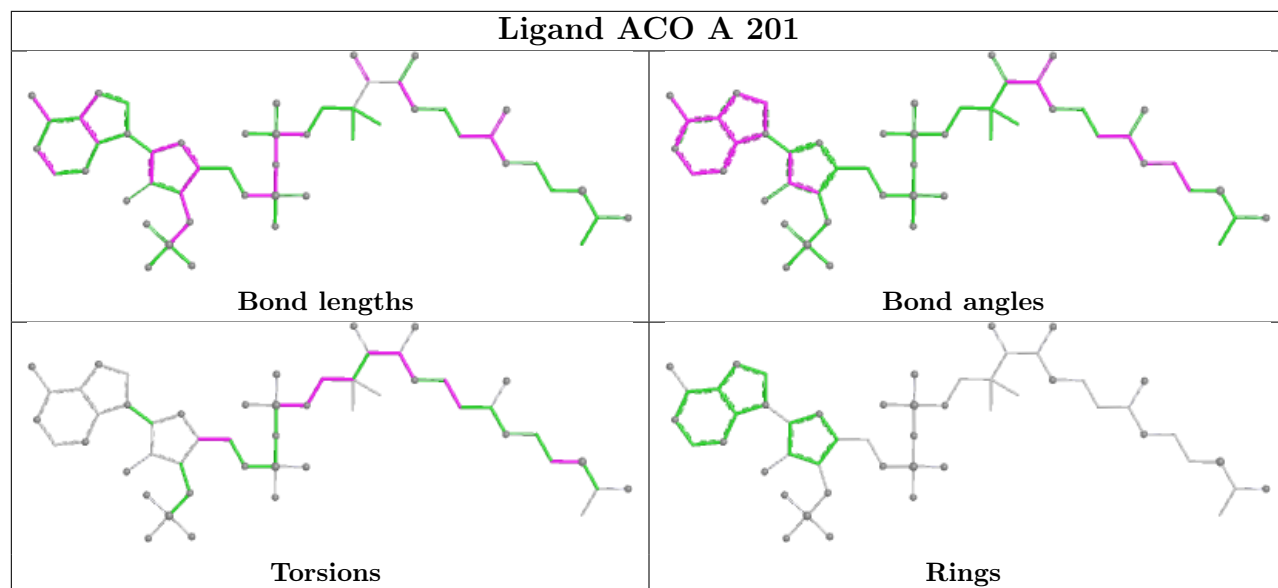
Bond angles



Torsions



Rings



5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

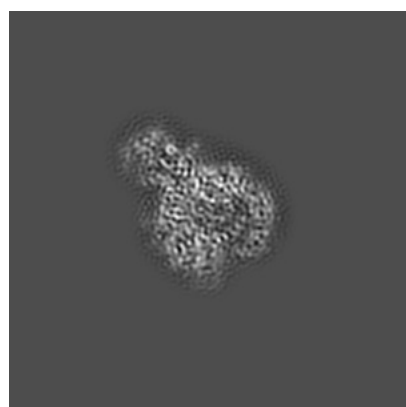
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-20442. These allow visual inspection of the internal detail of the map and identification of artifacts.

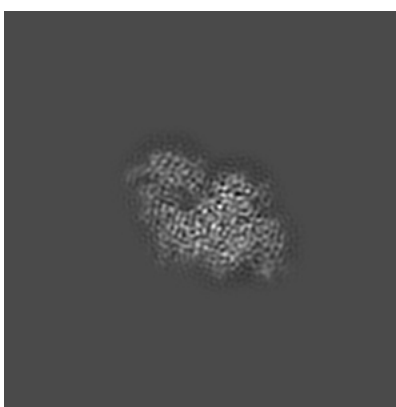
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

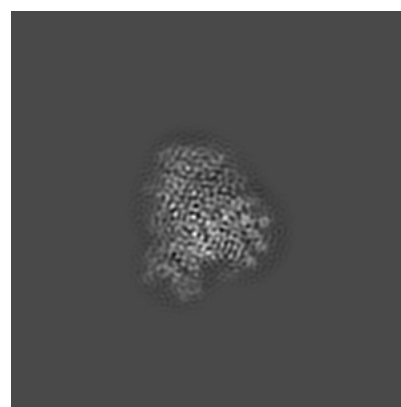
6.1.1 Primary map



X



Y

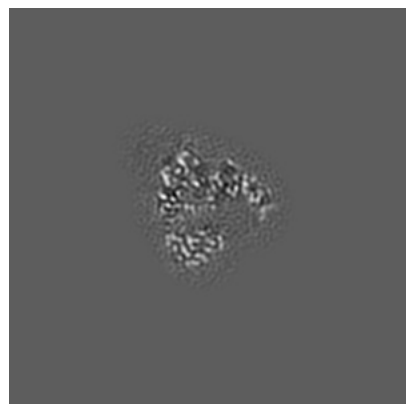


Z

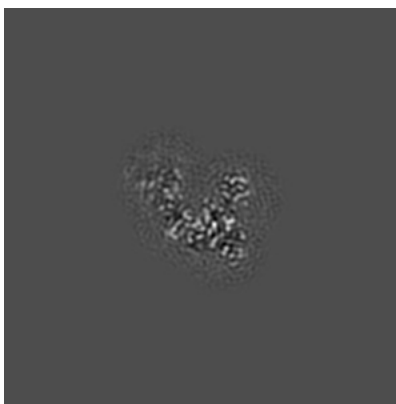
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

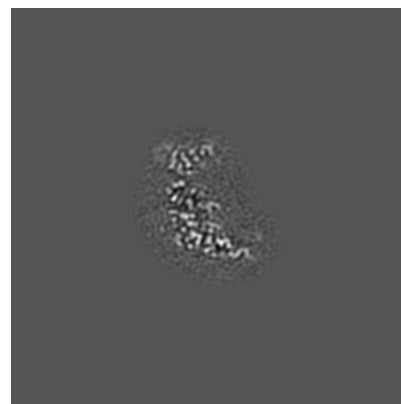
6.2.1 Primary map



X Index: 140



Y Index: 140

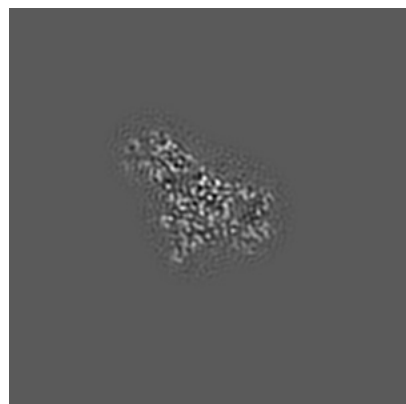


Z Index: 140

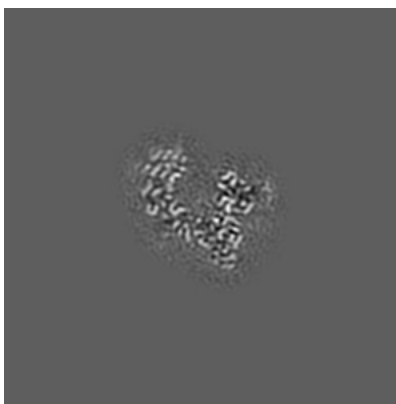
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

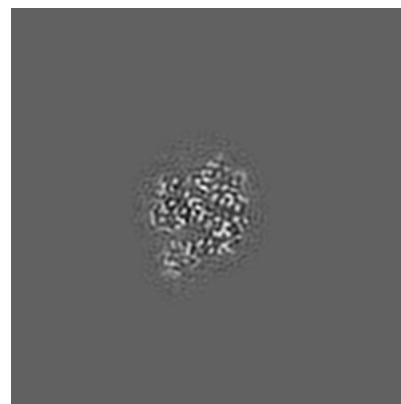
6.3.1 Primary map



X Index: 127



Y Index: 131

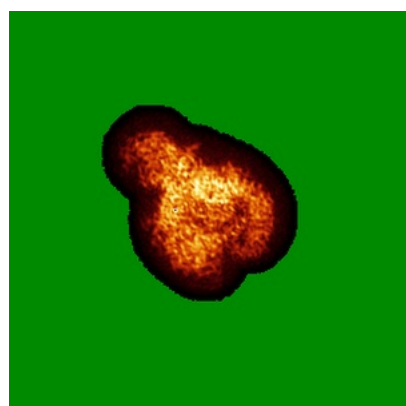


Z Index: 159

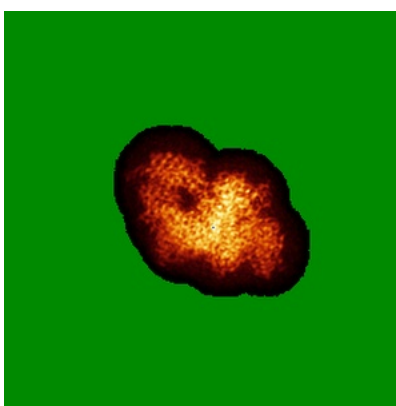
The images above show the largest variance slices of the map in three orthogonal directions.

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

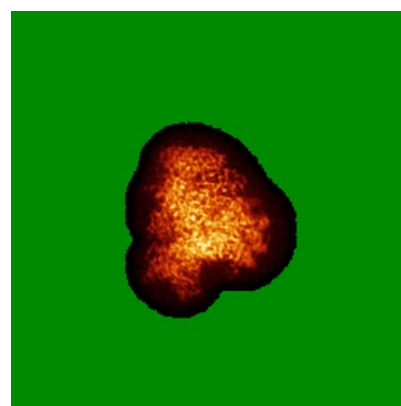
6.4.1 Primary map



X



Y

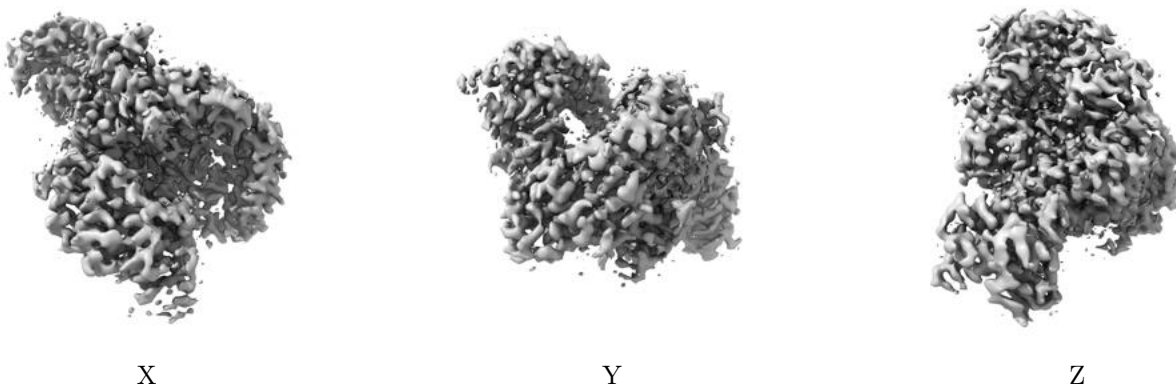


Z

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 0.015. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

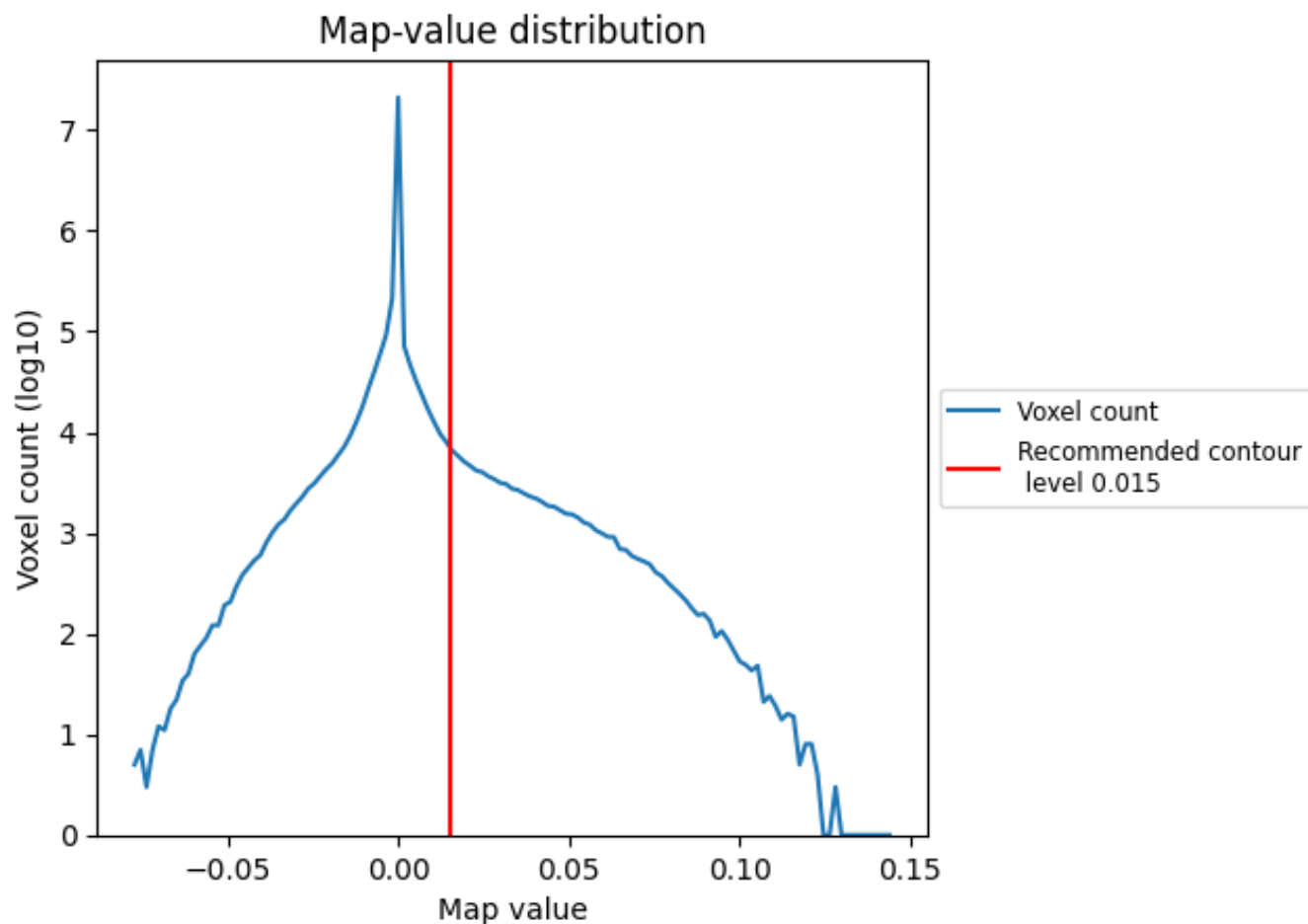
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

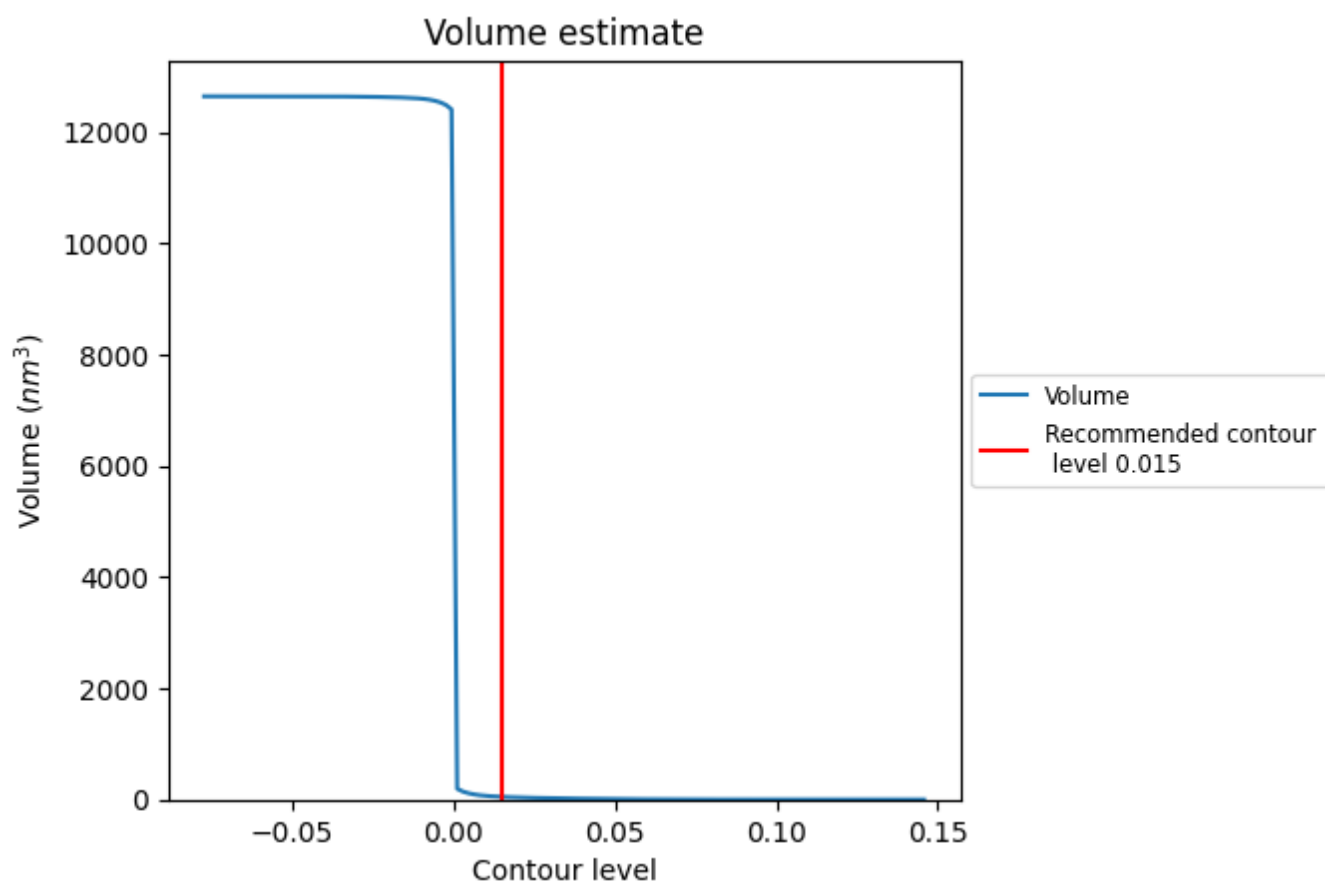
This section contains the results of statistical analysis of the map.

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.

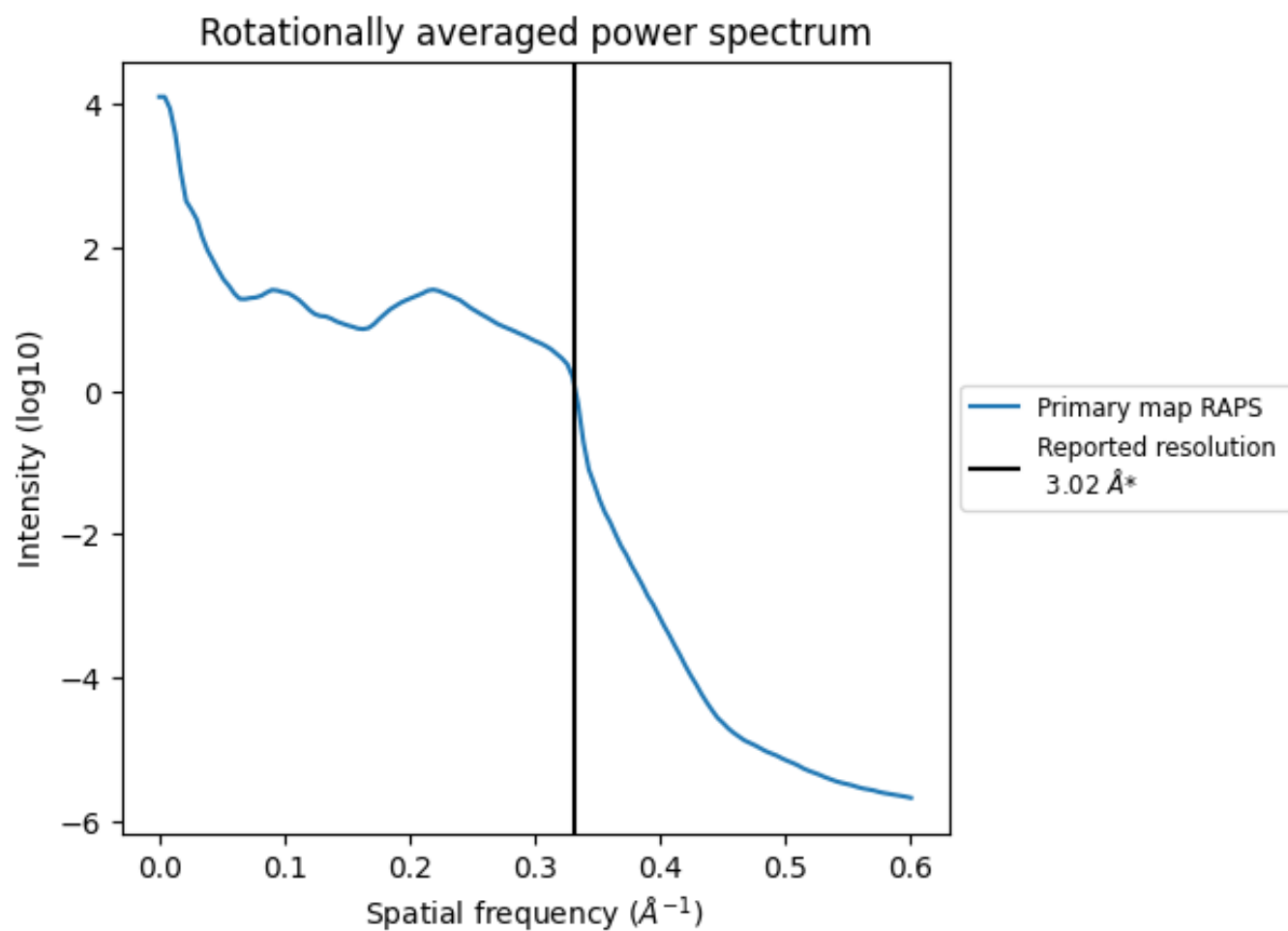
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 48 nm³; this corresponds to an approximate mass of 44 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 0.331 $\text{\AA}^{-1}$

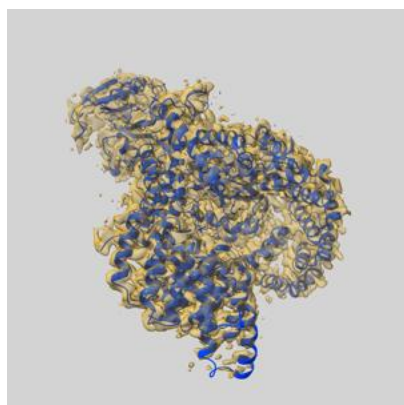
8 Fourier-Shell correlation

This section was not generated. No FSC curve or half-maps provided.

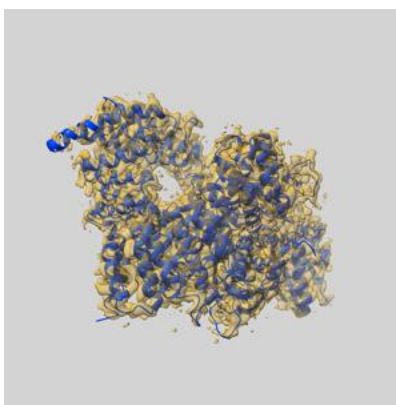
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-20442 and PDB model 6PPL. Per-residue inclusion information can be found in section [3](#) on page [5](#).

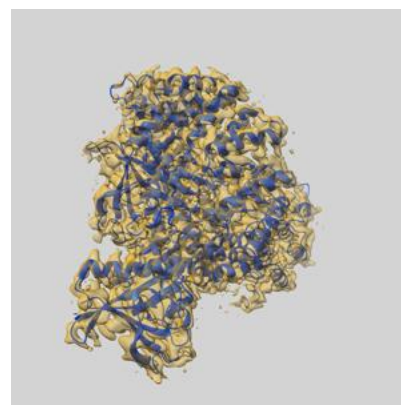
9.1 Map-model overlay [i](#)



X



Y



Z

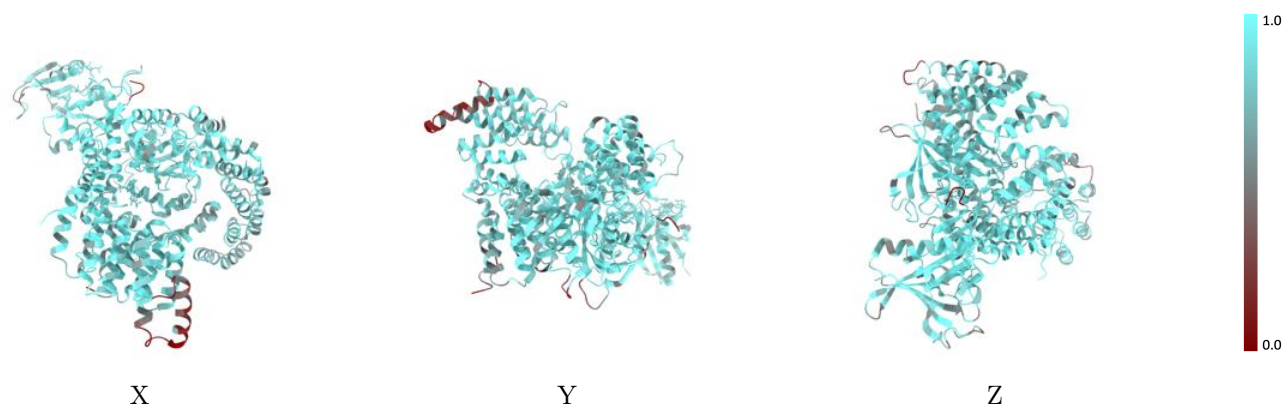
The images above show the 3D surface view of the map at the recommended contour level 0.015 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



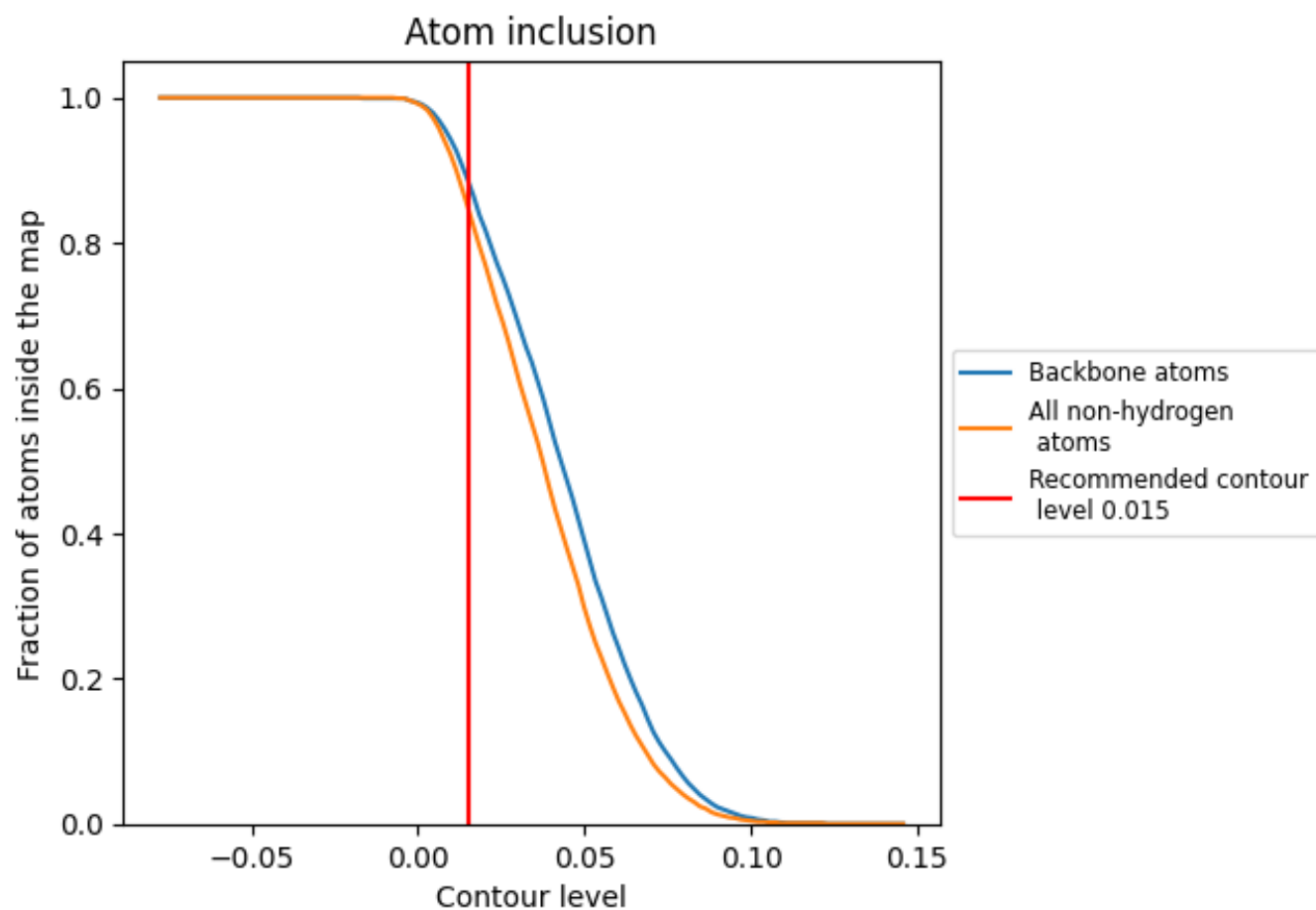
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.015).

9.4 Atom inclusion [i](#)



At the recommended contour level, 89% of all backbone atoms, 85% 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 (0.015) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8490	0.5700
A	0.8350	0.5430
B	0.8350	0.5690
C	0.9220	0.6040

