WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report (i)

Feb 18, 2026 – 11:27 AM EST

PDB ID	:	9Q3U / pdb_00009q3u
EMDB ID	:	EMD-72207
Title	:	Cryo EM structure of elk ACE2 in complex with SARS-CoV-2 spike trimer
Authors	:	Ye, K.; Tao, Y.J.; Wan, X.F.
Deposited on	:	2025-08-19
Resolution	:	3.37 Å(reported)
Based on initial model	:	8HFX

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

EMDB validation analysis	:	0.0.1.dev131
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
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)	:	2.48

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 3.37 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
Clashscore		6
Ramachandran outliers		0.1%
Sidechain outliers		3.8%

Worse   *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all EM structures

Metric	Model-Map Fit Percentile Ranks	Value
Q-score		0.359

Worse   *Better*

▮ Percentile relative to all EM structures
▯ Percentile relative to EM structures of similar resolution

Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	14287 (2.87 - 3.87)

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	622	22% — 71% 24% •
2	B	1284	6% — 71% 13% • 16%
2	C	1284	14% — 71% 13% • 16%
2	D	1284	12% — 69% 15% 16%

2　Entry composition ⓘ

There are 3 unique types of molecules in this entry. The entry contains 30729 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.
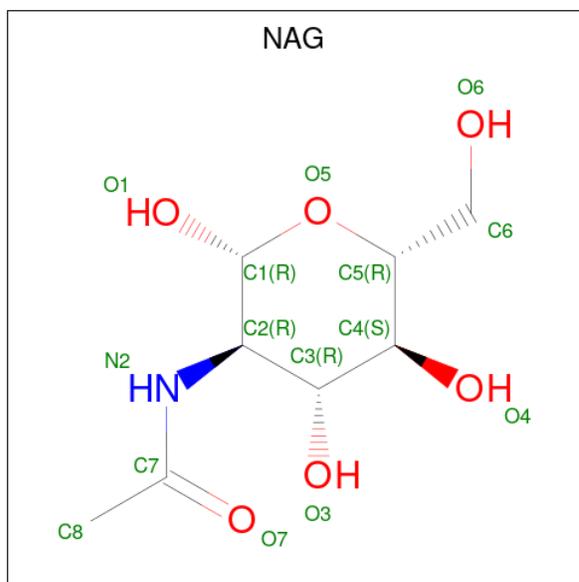
- Molecule 1 is a protein called Angiotensin-converting enzyme 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	595	Total 4886	C 3123	N 804	O 929	S 30	0	0

- Molecule 2 is a protein called Spike protein.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	1084	Total 8493	C 5429	N 1423	O 1603	S 38	0	0
2	C	1084	Total 8493	C 5429	N 1423	O 1603	S 38	0	0
2	D	1084	Total 8493	C 5429	N 1423	O 1603	S 38	0	0

- Molecule 3 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$) (labeled as "Ligand of Interest" by depositor).
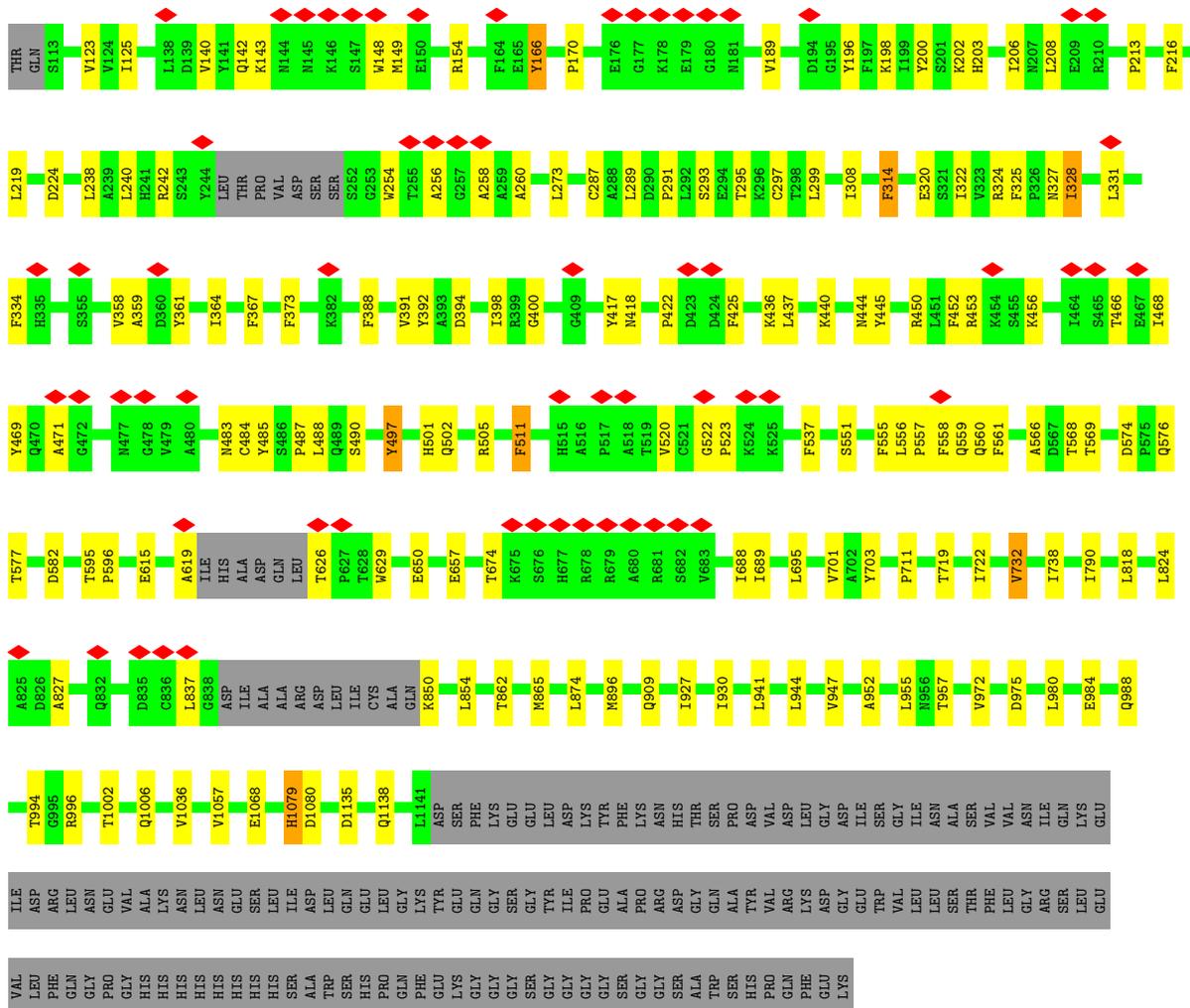
Mol	Chain	Residues	Atoms				AltConf
3	A	1	Total 14	C 8	N 1	O 5	0
3	A	1	Total 14	C 8	N 1	O 5	0
3	A	1	Total 14	C 8	N 1	O 5	0
3	B	1	Total 14	C 8	N 1	O 5	0
3	B	1	Total 14	C 8	N 1	O 5	0
3	B	1	Total 14	C 8	N 1	O 5	0
3	B	1	Total 14	C 8	N 1	O 5	0
3	B	1	Total 14	C 8	N 1	O 5	0
3	C	1	Total 14	C 8	N 1	O 5	0
3	C	1	Total 14	C 8	N 1	O 5	0
3	C	1	Total 14	C 8	N 1	O 5	0
3	C	1	Total 14	C 8	N 1	O 5	0
3	C	1	Total 14	C 8	N 1	O 5	0
3	C	1	Total 14	C 8	N 1	O 5	0
3	C	1	Total 14	C 8	N 1	O 5	0
3	C	1	Total 14	C 8	N 1	O 5	0
3	C	1	Total 14	C 8	N 1	O 5	0
3	D	1	Total 14	C 8	N 1	O 5	0
3	D	1	Total 14	C 8	N 1	O 5	0
3	D	1	Total 14	C 8	N 1	O 5	0
3	D	1	Total 14	C 8	N 1	O 5	0
3	D	1	Total 14	C 8	N 1	O 5	0

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

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: Angiotensin-converting enzyme 2

Chain A:

• Molecule 2: Spike protein

Chain B:

• Molecule 2: Spike protein

Chain C:

14%

71%   13%   •   16%

• Molecule 2: Spike protein

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	51163	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 $(e^-/\text{Å}^2)$	1.25	Depositor
Minimum defocus (nm)	800	Depositor
Maximum defocus (nm)	3000	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.475	Depositor
Minimum map value	-1.194	Depositor
Average map value	-0.001	Depositor
Map value standard deviation	0.042	Depositor
Recommended contour level	0.25	Depositor
Map size (Å)	499.2, 499.2, 499.2	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.832, 0.832, 0.832	Depositor

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	0.11	0/5022	0.31	0/6809
2	B	0.10	0/8695	0.28	0/11824
2	C	0.10	0/8695	0.24	0/11824
2	D	0.10	0/8695	0.24	0/11824
All	All	0.10	0/31107	0.26	0/42281

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 ⓘ

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	4886	0	4651	97	0
2	B	8493	0	8302	90	0
2	C	8493	0	8296	95	0
2	D	8493	0	8299	108	0
3	A	42	0	38	0	0
3	B	70	0	65	0	0
3	C	126	0	115	1	0
3	D	126	0	116	0	0
All	All	30729	0	29882	374	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 6.

All (374) 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)
2:B:556:LEU:HG	2:B:557:PRO:HD2	1.61	0.82
2:C:61:TRP:HE1	2:C:260:ALA:HB1	1.52	0.74
2:C:977:LEU:HD21	2:C:989:ILE:HD11	1.68	0.74
1:A:108:LEU:HD21	1:A:112:LYS:HB2	1.70	0.73
2:C:980:LEU:HD12	2:C:984:GLU:HG3	1.71	0.73
2:D:346:VAL:HA	2:D:396:PHE:HB2	1.71	0.72
1:A:262:PRO:HB3	1:A:611:PRO:HG3	1.72	0.71
2:D:166:TYR:HE1	2:D:168:SER:HB2	1.56	0.70
2:C:387:CYS:HA	2:C:521:CYS:HB3	1.73	0.69
2:C:289:LEU:HD23	2:C:290:ASP:HB2	1.74	0.69
2:C:324:ARG:HH12	2:C:529:LEU:HG	1.59	0.68
2:D:471:ALA:HB3	2:D:483:ASN:HB3	1.75	0.67
1:A:572:ILE:HG23	1:A:573:VAL:HG23	1.78	0.66
2:D:125:ILE:HB	2:D:166:TYR:HB3	1.77	0.66
2:C:240:LEU:HB3	2:C:254:TRP:HB3	1.78	0.66
1:A:555:GLN:O	1:A:559:LEU:HD22	1.96	0.65
2:B:596:PRO:HD3	2:B:688:ILE:HD11	1.79	0.64
2:B:287:CYS:HA	2:B:293:SER:HB3	1.80	0.64
1:A:397:GLU:HB2	1:A:513:ARG:HG3	1.80	0.64
2:B:125:ILE:HD12	2:B:166:TYR:HB3	1.80	0.64
2:D:817:LEU:HD11	2:D:935:SER:HB2	1.81	0.63
1:A:481:ARG:HG2	1:A:487:VAL:HG23	1.81	0.63
1:A:50:TYR:HB2	1:A:62:MET:HE1	1.80	0.62
2:B:189:VAL:HG23	2:B:219:LEU:HD22	1.80	0.62
1:A:355:PHE:HB3	1:A:378:ILE:HD12	1.81	0.62
1:A:455:LEU:HD23	1:A:511:PHE:HD2	1.63	0.62
2:B:468:ILE:HD12	2:B:484:CYS:HB3	1.82	0.61
2:B:289:LEU:HA	2:B:626:THR:HG21	1.83	0.61
2:B:398:ILE:HG23	2:B:400:GLY:H	1.63	0.61
2:D:561:PHE:HB2	2:D:563:ARG:HH12	1.66	0.60
1:A:94:LYS:HD2	1:A:97:LEU:HD21	1.83	0.60
2:B:123:VAL:HG23	2:B:170:PRO:HA	1.82	0.60
2:B:295:THR:O	2:B:299:LEU:HD23	2.02	0.60
2:B:38:LYS:HG3	2:C:559:GLN:HA	1.83	0.60
2:D:394:ASP:HB3	2:D:508:VAL:HG22	1.83	0.60
2:D:414:ILE:HA	2:D:418:ASN:HD22	1.66	0.59
2:D:98:ILE:C	2:D:99:ARG:HD2	2.26	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:530:VAL:HG11	2:D:533:LYS:HE3	1.83	0.59
1:A:265:LEU:H	1:A:265:LEU:HD23	1.67	0.58
2:B:972:VAL:HG13	2:B:975:ASP:HB3	1.86	0.58
2:C:782:LYS:HD3	2:D:1041:LYS:HZ1	1.69	0.58
2:D:96:ASN:HA	2:D:99:ARG:NH1	2.19	0.58
2:D:138:LEU:HB3	2:D:150:GLU:HB3	1.84	0.58
2:D:448:LEU:HB3	2:D:488:LEU:HB3	1.85	0.57
2:C:1101:THR:HG22	2:C:1108:PRO:HA	1.86	0.57
2:B:497:TYR:HB3	2:B:501:HIS:HB2	1.86	0.57
2:D:140:VAL:HG22	2:D:150:GLU:HG2	1.86	0.57
1:A:277:LEU:HD23	1:A:280:LEU:HD13	1.87	0.57
2:B:980:LEU:HD13	2:B:984:GLU:HG2	1.86	0.57
2:C:970:SER:HB3	2:C:976:ILE:HD11	1.86	0.57
2:B:417:TYR:HB3	2:B:453:ARG:HG2	1.87	0.57
2:B:418:ASN:HD21	2:B:450:ARG:H	1.53	0.57
2:D:86:GLY:HA3	2:D:266:LEU:HD12	1.87	0.57
1:A:424:GLU:HG3	1:A:426:ASP:H	1.70	0.56
2:B:827:ALA:HB2	2:B:952:ALA:HB1	1.87	0.56
2:D:824:LEU:HD22	2:D:834:GLY:HA3	1.87	0.56
2:D:711:PRO:HA	2:D:1068:GLU:HA	1.88	0.56
1:A:331:MET:HA	1:A:331:MET:HE2	1.87	0.56
2:C:334:PHE:HB2	2:C:364:ILE:HD11	1.88	0.56
1:A:540:LYS:HZ3	1:A:542:ASP:H	1.53	0.55
2:B:327:ASN:O	2:B:328:ILE:HG13	2.06	0.55
2:B:738:ILE:HG12	2:B:996:ARG:HB3	1.89	0.55
2:C:60:THR:HB	2:C:263:VAL:HG13	1.88	0.55
2:C:185:LEU:HD12	2:C:206:ILE:HG21	1.88	0.55
2:D:509:LEU:HB3	2:D:511:PHE:HE2	1.71	0.55
2:B:551:SER:HB2	2:B:582:ASP:HB2	1.89	0.55
2:D:722:ILE:HG12	2:D:1057:VAL:HG22	1.89	0.55
2:D:198:LYS:HG2	2:D:224:ASP:HB2	1.89	0.54
1:A:88:ILE:HB	1:A:94:LYS:HD3	1.90	0.54
2:B:984:GLU:O	2:B:988:GLN:HG2	2.08	0.54
2:D:340:ALA:HB3	2:D:343:PHE:HE1	1.73	0.54
1:A:378:ILE:HG22	1:A:382:MET:HE2	1.90	0.54
2:D:834:GLY:HA2	2:D:837:LEU:HD12	1.90	0.54
1:A:595:LYS:HA	1:A:595:LYS:HE2	1.90	0.53
2:D:103:PHE:HB3	2:D:114:LEU:HB3	1.89	0.53
2:B:559:GLN:HG2	2:D:38:LYS:HG2	1.88	0.53
2:B:711:PRO:HA	2:B:1068:GLU:HA	1.90	0.53
1:A:322:MET:HE2	1:A:322:MET:N	2.23	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:405:GLU:HB3	1:A:521:GLN:HG3	1.90	0.53
2:C:1099:PHE:HZ	3:C:1308:NAG:H62	1.74	0.53
2:C:91:SER:HB2	2:C:93:GLU:HG3	1.89	0.53
1:A:406:ILE:HG13	1:A:521:GLN:HG2	1.91	0.53
2:B:322:ILE:HG23	2:B:537:PHE:HA	1.90	0.53
2:B:722:ILE:HG12	2:B:1057:VAL:HG22	1.91	0.53
2:D:1112:THR:HG22	2:D:1134:TYR:HB3	1.91	0.53
2:B:61:TRP:HE1	2:B:260:ALA:HB1	1.74	0.52
2:B:445:TYR:HE1	2:B:490:SER:HA	1.74	0.52
2:B:143:LYS:HB2	2:B:149:MET:HG2	1.91	0.52
2:B:862:THR:HG22	2:B:865:MET:HE3	1.90	0.52
2:C:40:PHE:HE2	2:D:553:LYS:HD2	1.75	0.52
2:D:493:PHE:HB3	2:D:503:PRO:HD3	1.91	0.52
1:A:262:PRO:HA	1:A:487:VAL:HG12	1.91	0.52
2:D:352:LYS:HB3	2:D:393:ALA:HB3	1.92	0.52
2:C:732:VAL:HG11	2:C:1000:LEU:HD21	1.92	0.51
2:D:175:LEU:HD11	2:D:186:ARG:HH11	1.75	0.51
2:D:445:TYR:HD1	2:D:490:SER:HB3	1.75	0.51
2:D:976:ILE:HG21	2:D:988:GLN:HB2	1.92	0.51
2:D:638:VAL:HG22	2:D:647:ILE:HG23	1.93	0.51
1:A:548:GLU:O	1:A:551:GLN:HG2	2.10	0.51
1:A:207:GLU:HG3	1:A:218:ARG:HG3	1.92	0.51
1:A:502:LEU:HB3	1:A:505:VAL:HG22	1.92	0.51
2:C:973:LEU:HD11	2:C:989:ILE:HG12	1.93	0.51
2:C:140:VAL:HG22	2:C:148:TRP:HE3	1.76	0.50
1:A:79:MET:HE2	1:A:79:MET:HA	1.92	0.50
1:A:214:TYR:HB3	1:A:566:THR:HB	1.94	0.50
2:D:468:ILE:HB	2:D:478:GLY:HA2	1.93	0.50
2:D:984:GLU:O	2:D:988:GLN:HG2	2.12	0.50
2:C:351:ARG:HH22	2:C:392:TYR:HA	1.76	0.50
2:B:558:PHE:CG	2:D:38:LYS:HE2	2.47	0.49
2:C:82:PRO:HA	2:C:233:ARG:HA	1.94	0.49
1:A:424:GLU:HB3	1:A:427:PHE:HB2	1.92	0.49
2:B:555:PHE:CD2	2:B:559:GLN:HB2	2.48	0.49
2:C:540:ASN:HD21	2:C:575:PRO:HB3	1.78	0.49
2:D:898:MET:HE3	2:D:1045:LEU:HD13	1.95	0.49
2:C:176:GLU:HB2	2:C:178:LYS:HE3	1.93	0.49
2:D:607:LEU:HB2	2:D:646:LEU:HD12	1.94	0.49
2:B:189:VAL:HB	2:B:200:TYR:HB2	1.94	0.49
2:C:371:PHE:H	2:C:432:TRP:HA	1.77	0.49
2:D:192:ASN:HA	2:D:196:TYR:O	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:650:GLU:HG3	2:B:689:ILE:HG22	1.94	0.49
2:B:732:VAL:HG23	2:B:854:LEU:HD23	1.94	0.49
2:C:481:GLY:H	2:C:484:CYS:HB2	1.76	0.49
2:C:444:ASN:HB2	2:C:493:PHE:HB2	1.95	0.49
2:C:782:LYS:HG3	2:C:783:GLN:HG3	1.95	0.49
2:D:164:PHE:HE2	2:D:227:ILE:HG22	1.77	0.49
1:A:417:LEU:HB3	1:A:423:LEU:HB2	1.95	0.49
2:B:437:LEU:HD11	2:B:505:ARG:HH12	1.78	0.49
1:A:36:ALA:HB2	1:A:72:PHE:HE2	1.78	0.49
1:A:264:HIS:CE1	1:A:269:MET:HG2	2.48	0.49
2:B:450:ARG:HG3	2:B:487:PRO:HB3	1.95	0.48
2:C:315:ARG:HG2	2:C:588:PHE:HB2	1.93	0.48
1:A:556:MET:HE3	1:A:572:ILE:HB	1.96	0.48
2:C:422:PRO:HD3	2:C:459:PRO:HB3	1.96	0.48
1:A:461:MET:HB3	1:A:467:ILE:HG13	1.96	0.48
1:A:103:SER:HB2	1:A:106:SER:HB2	1.95	0.48
2:C:166:TYR:HD2	2:C:225:LEU:HD21	1.78	0.48
2:C:276:ASN:HD21	2:C:278:ASN:HB2	1.78	0.48
2:D:99:ARG:HH12	2:D:175:LEU:HD12	1.78	0.48
2:B:896:MET:HE1	2:C:1090:VAL:HG23	1.95	0.48
2:D:122:ASN:HA	2:D:170:PRO:HD3	1.95	0.48
2:B:202:LYS:HB3	2:B:219:LEU:HG	1.95	0.48
1:A:72:PHE:O	1:A:76:GLN:HG2	2.13	0.48
2:B:466:THR:HB	2:B:487:PRO:HD2	1.96	0.48
1:A:58:ASN:O	1:A:62:MET:HE3	2.14	0.47
1:A:228:THR:HG22	1:A:580:VAL:HB	1.95	0.47
2:C:984:GLU:O	2:C:988:GLN:HG2	2.14	0.47
1:A:403:VAL:HG11	1:A:557:LEU:HD11	1.95	0.47
1:A:437:PHE:HA	1:A:440:LYS:HG2	1.96	0.47
2:C:123:VAL:HG23	2:C:170:PRO:HA	1.96	0.47
2:C:472:GLY:H	2:C:483:ASN:HB3	1.79	0.47
2:C:650:GLU:HG3	2:C:689:ILE:HG22	1.96	0.47
2:D:351:ARG:HH21	2:D:392:TYR:HE2	1.61	0.47
1:A:246:LYS:HD2	1:A:246:LYS:HA	1.73	0.47
1:A:251:TYR:HB3	1:A:254:TYR:HB2	1.96	0.47
1:A:58:ASN:C	1:A:62:MET:HE3	2.39	0.47
2:D:617:PRO:HB3	2:D:634:THR:HG22	1.97	0.47
2:C:346:VAL:HG22	2:C:418:ASN:HB3	1.97	0.47
2:C:403:VAL:HG21	2:C:504:TYR:HD2	1.80	0.47
2:C:422:PRO:HD2	2:C:425:PHE:HD2	1.80	0.47
2:C:440:LYS:HE2	2:C:444:ASN:HA	1.97	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:718:VAL:HG22	2:C:1061:VAL:HG22	1.97	0.47
2:D:672:THR:HA	2:D:686:GLN:HA	1.96	0.47
2:C:333:PRO:HG2	2:C:354:ILE:HG12	1.96	0.47
2:D:240:LEU:HD22	2:D:254:TRP:HB3	1.97	0.47
2:D:744:GLU:O	2:D:748:LEU:HG	2.14	0.47
1:A:51:ASN:HB3	1:A:358:LYS:HZ2	1.79	0.47
1:A:222:MET:O	1:A:226:GLU:HG2	2.15	0.47
2:B:196:TYR:CE1	2:B:224:ASP:HB2	2.50	0.47
2:C:123:VAL:HG11	2:C:171:PHE:HE2	1.80	0.47
2:C:202:LYS:HB2	2:C:219:LEU:HG	1.96	0.47
2:C:314:PHE:HE1	2:C:619:ALA:HB2	1.80	0.47
2:D:927:ILE:HG22	2:D:931:GLN:OE1	2.14	0.47
1:A:456:GLU:HG2	1:A:512:ILE:HB	1.97	0.46
2:B:1002:THR:O	2:B:1006:GLN:HG2	2.15	0.46
2:B:456:LYS:HE2	2:B:456:LYS:HB2	1.55	0.46
2:B:955:LEU:HD12	2:B:955:LEU:HA	1.76	0.46
2:C:187:GLU:C	2:C:188:PHE:HD2	2.23	0.46
2:C:324:ARG:HD3	2:C:526:SER:HB3	1.98	0.46
1:A:120:LEU:HD23	1:A:123:MET:HE3	1.95	0.46
2:C:189:VAL:HB	2:C:200:TYR:HB2	1.96	0.46
2:C:989:ILE:O	2:C:993:ILE:HG13	2.15	0.46
2:D:573:ARG:HG3	2:D:580:ILE:HG13	1.98	0.46
1:A:145:PRO:HA	1:A:149:ASP:HB2	1.98	0.46
2:B:324:ARG:HD2	2:B:576:GLN:HG2	1.97	0.46
2:C:33:VAL:HG13	2:C:52:PHE:HE2	1.80	0.46
2:D:164:PHE:CE2	2:D:227:ILE:HG22	2.51	0.46
2:B:32:GLY:HA3	2:B:53:LEU:HD23	1.98	0.46
2:C:1000:LEU:HD23	2:C:1000:LEU:HA	1.79	0.46
2:C:744:GLU:OE1	2:C:977:LEU:HG	2.15	0.46
2:D:1002:THR:O	2:D:1006:GLN:HG2	2.16	0.45
2:D:193:ILE:HB	2:D:196:TYR:HE1	1.81	0.45
2:D:452:PHE:CD2	2:D:469:TYR:HB2	2.51	0.45
2:D:926:ALA:O	2:D:930:ILE:HG22	2.16	0.45
1:A:160:ARG:HB3	1:A:264:HIS:HB3	1.97	0.45
2:B:65:ILE:HD12	2:B:256:ALA:HB3	1.99	0.45
2:B:314:PHE:HE1	2:B:619:ALA:HB2	1.81	0.45
2:C:389:THR:HG21	2:C:516:ALA:H	1.81	0.45
2:B:65:ILE:HG22	2:B:258:ALA:HA	1.99	0.45
2:B:142:GLN:HA	2:B:148:TRP:HA	1.98	0.45
2:B:703:TYR:HB3	2:D:788:PRO:HG3	1.99	0.45
2:D:420:LYS:HG2	2:D:459:PRO:HG3	1.98	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:119:ILE:HA	1:A:122:THR:HG22	1.99	0.45
2:C:289:LEU:HA	2:C:626:THR:HG21	1.99	0.45
1:A:369:LEU:HD11	1:A:408:SER:O	2.17	0.45
2:C:331:LEU:HD12	2:C:331:LEU:HA	1.84	0.45
2:C:573:ARG:HA	2:C:580:ILE:HA	1.98	0.45
2:B:24:SER:HB2	2:B:61:TRP:HB3	1.99	0.45
2:D:596:PRO:HB3	2:D:670:TYR:HB2	1.97	0.45
1:A:538:LEU:HD23	1:A:586:TYR:HB2	1.99	0.45
2:B:198:LYS:HE3	2:B:198:LYS:HB3	1.80	0.45
2:C:326:PRO:HB2	2:C:328:ILE:HG13	1.99	0.45
1:A:304:GLU:O	1:A:308:LYS:HG3	2.16	0.45
2:C:517:PRO:HD3	2:C:560:GLN:HG3	1.99	0.45
2:D:755:PHE:HD2	2:D:997:LEU:HD21	1.82	0.45
1:A:322:MET:SD	1:A:375:MET:HE1	2.57	0.45
2:D:766:ILE:O	2:D:770:GLN:HG2	2.17	0.45
1:A:321:HIS:C	1:A:322:MET:HE2	2.42	0.44
2:B:154:ARG:HD2	2:B:154:ARG:HA	1.82	0.44
2:B:629:TRP:HA	2:B:629:TRP:CE3	2.53	0.44
2:B:440:LYS:O	2:B:444:ASN:HB2	2.17	0.44
2:B:824:LEU:HD23	2:B:824:LEU:H	1.83	0.44
2:D:306:LYS:HB3	2:D:306:LYS:HE2	1.80	0.44
2:C:493:PHE:CZ	2:C:503:PRO:HB3	2.53	0.44
2:C:980:LEU:CD1	2:C:984:GLU:HG3	2.45	0.44
1:A:399:PHE:HE2	1:A:565:TRP:HB2	1.83	0.44
2:C:306:LYS:HE2	2:C:306:LYS:HB3	1.76	0.44
2:C:419:TYR:HE2	2:C:508:VAL:HG21	1.82	0.44
2:D:197:PHE:HB3	2:D:225:LEU:O	2.18	0.44
1:A:94:LYS:HD2	1:A:94:LYS:HA	1.81	0.44
1:A:108:LEU:HD22	1:A:189:MET:HE1	1.99	0.44
1:A:357:ILE:HD12	1:A:374:GLU:HB3	1.99	0.44
2:C:388:PHE:HB2	2:C:511:PHE:CE1	2.52	0.44
2:D:82:PRO:HA	2:D:233:ARG:HA	2.00	0.44
2:D:798:PHE:HD1	2:D:801:ILE:HD11	1.82	0.44
1:A:24:GLN:HG2	2:B:471:ALA:HB1	2.00	0.44
1:A:418:LYS:HB2	1:A:418:LYS:HE2	1.77	0.44
2:B:561:PHE:N	2:B:561:PHE:CD1	2.84	0.44
2:C:98:ILE:HG12	2:C:101:TRP:HZ3	1.83	0.44
2:C:712:THR:HG21	2:C:1069:LYS:HD3	2.00	0.44
2:D:817:LEU:HD21	2:D:935:SER:HA	1.99	0.44
1:A:85:LEU:HD12	1:A:85:LEU:H	1.83	0.44
1:A:330:SER:HB2	1:A:357:ILE:H	1.83	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:33:VAL:HG11	2:B:216:PHE:CZ	2.53	0.44
2:B:909:GLN:H	2:B:909:GLN:HG2	1.54	0.44
2:D:231:ILE:HD13	2:D:231:ILE:HA	1.87	0.44
2:B:818:LEU:HD22	2:B:941:LEU:HD21	2.00	0.43
2:C:36:PRO:HG2	2:C:48:THR:HG21	2.00	0.43
2:C:102:ILE:HG23	2:C:237:LEU:HD11	2.00	0.43
2:C:759:LEU:HD22	2:C:1004:VAL:HG21	2.00	0.43
2:C:934:LEU:HD23	2:C:934:LEU:HA	1.86	0.43
2:D:99:ARG:HD2	2:D:99:ARG:N	2.33	0.43
2:D:595:THR:HG22	2:D:597:GLY:H	1.83	0.43
2:D:830:ILE:HD11	2:D:955:LEU:HD12	2.00	0.43
2:B:466:THR:HG21	2:B:488:LEU:HD11	1.99	0.43
1:A:229:PHE:HE2	1:A:233:LYS:HE3	1.83	0.43
2:B:1135:ASP:HB3	2:B:1138:GLN:HG2	1.99	0.43
2:D:54:PRO:HG3	2:D:269:ARG:HE	1.83	0.43
1:A:377:HIS:CE1	1:A:401:GLU:HA	2.54	0.43
1:A:588:GLU:HB3	1:A:589:PRO:HD3	1.99	0.43
2:B:240:LEU:HD23	2:B:240:LEU:HA	1.88	0.43
2:D:1077:ILE:HD13	2:D:1131:ASN:HB3	2.01	0.43
2:D:1078:CYS:HB2	2:D:1122:CYS:HB2	1.50	0.43
2:C:513:LEU:HG	2:C:514:LEU:HD12	2.01	0.43
2:C:525:LYS:HD2	2:C:525:LYS:HA	1.81	0.43
2:D:574:ASP:HB3	2:D:577:THR:HG22	2.01	0.43
1:A:383:ALA:CB	1:A:557:LEU:HB3	2.49	0.43
2:B:695:LEU:HD22	2:D:869:TYR:CZ	2.54	0.43
2:B:865:MET:HE1	2:C:665:GLY:HA3	1.99	0.43
2:C:548:LEU:HD23	2:C:581:LEU:HD22	2.01	0.43
2:C:813:PHE:CD1	2:C:813:PHE:N	2.86	0.43
2:B:334:PHE:CZ	2:B:359:ALA:HB2	2.53	0.43
2:D:759:LEU:HD13	2:D:1000:LEU:HG	2.01	0.43
2:D:817:LEU:HD23	2:D:821:LYS:HG3	2.01	0.43
1:A:195:TYR:HD2	1:A:201:TYR:HB2	1.84	0.42
2:B:53:LEU:HD12	2:B:54:PRO:HD2	2.01	0.42
2:B:361:TYR:N	2:B:361:TYR:CD1	2.84	0.42
2:C:813:PHE:N	2:C:813:PHE:HD1	2.17	0.42
2:D:238:LEU:HD12	2:D:240:LEU:HG	2.00	0.42
1:A:214:TYR:HA	1:A:576:LYS:HE2	2.02	0.42
1:A:264:HIS:HE1	1:A:269:MET:HG2	1.84	0.42
2:B:291:PRO:HG3	2:B:629:TRP:CZ3	2.54	0.42
2:D:447:TYR:HD2	2:D:493:PHE:HE2	1.67	0.42
1:A:261:LEU:HD13	1:A:266:LEU:HD11	1.99	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:332:LEU:HD12	1:A:332:LEU:HA	1.85	0.42
2:B:208:LEU:HD12	2:B:213:PRO:HB3	2.01	0.42
2:D:981:ASP:OD1	2:D:984:GLU:HB2	2.19	0.42
1:A:406:ILE:HD11	1:A:524:PHE:HB2	2.01	0.42
2:D:734:CYS:HB3	2:D:756:CYS:HB3	1.83	0.42
1:A:468:PRO:HD2	1:A:471:GLN:HG3	2.00	0.42
1:A:475:LYS:HA	1:A:475:LYS:HD3	1.72	0.42
2:B:242:ARG:HG2	2:B:254:TRP:CD1	2.54	0.42
2:B:452:PHE:HB3	2:B:469:TYR:CE1	2.54	0.42
2:C:103:PHE:HD1	2:C:103:PHE:HA	1.66	0.42
2:C:987:VAL:O	2:C:991:ARG:HG2	2.19	0.42
2:D:349:TRP:N	2:D:462:ARG:HH12	2.18	0.42
2:C:114:LEU:HD12	2:C:127:VAL:HG22	2.02	0.42
2:C:398:ILE:HD11	2:C:506:VAL:HG21	2.01	0.42
2:C:790:ILE:HD12	2:C:790:ILE:HA	1.95	0.42
2:B:957:THR:HG21	2:D:758:GLN:NE2	2.35	0.42
2:D:536:ASN:HA	2:D:545:THR:HA	2.02	0.42
2:D:704:SER:HB3	2:D:707:SER:HB2	2.00	0.42
1:A:131:LYS:HA	1:A:131:LYS:HD2	1.65	0.42
2:B:558:PHE:CD1	2:D:38:LYS:HE2	2.55	0.42
2:D:31:ARG:HD2	2:D:31:ARG:HA	1.87	0.42
2:D:227:ILE:HG13	2:D:228:GLY:H	1.84	0.42
2:D:850:LYS:HE2	2:D:850:LYS:HB2	1.80	0.42
1:A:222:MET:HE2	1:A:222:MET:HB2	1.95	0.42
2:B:208:LEU:HD23	2:B:208:LEU:HA	1.81	0.42
2:D:970:SER:O	2:D:976:ILE:HD11	2.20	0.42
1:A:45:LEU:HD12	1:A:45:LEU:HA	1.93	0.41
2:C:242:ARG:HD2	2:C:242:ARG:HA	1.74	0.41
2:C:976:ILE:O	2:C:980:LEU:HB2	2.19	0.41
2:D:982:LYS:HB2	2:D:982:LYS:HE2	1.84	0.41
1:A:469:LYS:HA	1:A:469:LYS:HD2	1.86	0.41
2:B:483:ASN:HA	2:B:485:TYR:CZ	2.55	0.41
2:B:566:ALA:O	2:B:568:THR:HG23	2.20	0.41
2:D:333:PRO:HD2	2:D:354:ILE:HG23	2.02	0.41
1:A:91:LEU:HD11	1:A:210:GLU:HB3	2.03	0.41
1:A:108:LEU:HG	1:A:109:SER:O	2.19	0.41
1:A:349:ASP:HA	1:A:355:PHE:HD1	1.85	0.41
1:A:405:GLU:HG3	1:A:517:ARG:HE	1.85	0.41
1:A:418:LYS:HG3	1:A:423:LEU:HD23	2.03	0.41
2:B:388:PHE:CG	2:B:511:PHE:HB3	2.56	0.41
2:B:556:LEU:HD23	2:D:38:LYS:HE3	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:196:TYR:HA	2:D:226:PRO:HB3	2.02	0.41
1:A:203:ARG:HH22	1:A:460:TRP:CD1	2.38	0.41
1:A:52:THR:HB	1:A:339:ARG:HH21	1.85	0.41
1:A:164:TRP:HE1	1:A:168:ARG:CZ	2.33	0.41
2:B:1079:HIS:CE1	2:B:1080:ASP:HB2	2.56	0.41
2:C:306:LYS:HG3	2:C:596:PRO:HA	2.03	0.41
2:D:227:ILE:HG13	2:D:228:GLY:N	2.36	0.41
1:A:403:VAL:HA	1:A:406:ILE:HD12	2.03	0.41
2:B:522:GLY:HA2	2:B:523:PRO:HD3	1.90	0.41
2:C:138:LEU:HG	2:C:150:GLU:HG3	2.03	0.41
2:D:594:ILE:HD13	2:D:646:LEU:HD11	2.02	0.41
2:D:819:PHE:CD1	2:D:1053:PRO:HG3	2.55	0.41
2:D:1135:ASP:HB3	2:D:1138:GLN:HB2	2.03	0.41
1:A:538:LEU:HD12	1:A:538:LEU:HA	1.87	0.41
2:C:90:ALA:HA	2:C:186:ARG:O	2.21	0.41
2:D:829:PHE:HB2	2:D:851:PHE:CE2	2.56	0.41
1:A:143:LEU:HD12	1:A:143:LEU:HA	1.88	0.41
2:C:574:ASP:HB2	2:C:581:LEU:HD11	2.01	0.41
1:A:97:LEU:HA	1:A:100:LEU:HG	2.02	0.41
1:A:589:PRO:HA	1:A:592:THR:HG22	2.03	0.41
2:B:574:ASP:OD2	2:B:577:THR:HG22	2.21	0.41
2:B:850:LYS:HB2	2:B:850:LYS:HE2	1.81	0.41
2:B:944:LEU:O	2:B:947:VAL:HG12	2.21	0.41
2:C:283:ASP:HB3	2:C:302:PHE:HE2	1.85	0.41
2:C:406:ILE:HD11	2:C:429:VAL:HG11	2.03	0.41
2:D:1045:LEU:HD23	2:D:1045:LEU:HA	1.94	0.41
2:B:38:LYS:HG2	2:C:558:PHE:CD2	2.56	0.41
2:C:388:PHE:HB3	2:C:512:GLU:O	2.21	0.41
2:C:837:LEU:HD23	2:C:837:LEU:HA	1.81	0.40
2:D:299:LEU:HD23	2:D:299:LEU:HA	1.90	0.40
2:D:458:LYS:HA	2:D:458:LYS:HD3	1.71	0.40
2:D:738:ILE:HD11	2:D:997:LEU:HD13	2.03	0.40
2:B:422:PRO:HG2	2:B:425:PHE:HB2	2.02	0.40
2:C:979:ARG:HG3	2:D:378:VAL:HG23	2.02	0.40
2:D:208:LEU:HD12	2:D:208:LEU:HA	1.96	0.40
1:A:176:ARG:HB2	1:A:497:CYS:H	1.86	0.40
1:A:362:LYS:HE2	1:A:362:LYS:HB2	1.93	0.40
2:B:927:ILE:O	2:B:930:ILE:HG22	2.20	0.40
1:A:83:TYR:HB3	1:A:88:ILE:HD11	2.04	0.40
1:A:502:LEU:HG	1:A:504:HIS:H	1.86	0.40
2:B:711:PRO:HD3	2:D:890:LEU:HD13	2.02	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:208:LEU:HD12	2:C:208:LEU:HA	1.89	0.40
2:D:201:SER:HB2	2:D:222:LEU:HD11	2.04	0.40
1:A:259:GLY:HA2	1:A:609:TRP:HB3	2.03	0.40
1:A:481:ARG:HB3	1:A:607:THR:HG23	2.04	0.40
2:B:560:GLN:HB2	2:B:561:PHE:CD1	2.57	0.40
2:C:748:LEU:HD12	2:C:989:ILE:HG21	2.02	0.40
2:D:144:ASN:O	2:D:146:LYS:HG2	2.21	0.40
2:D:555:PHE:HB3	2:D:573:ARG:NH2	2.37	0.40
2:D:671:GLN:HG3	2:D:689:ILE:HD11	2.03	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	593/622 (95%)	563 (95%)	30 (5%)	0	100	100
2	B	1072/1284 (84%)	1031 (96%)	39 (4%)	2 (0%)	44	72
2	C	1072/1284 (84%)	1046 (98%)	26 (2%)	0	100	100
2	D	1072/1284 (84%)	1045 (98%)	27 (2%)	0	100	100
All	All	3809/4474 (85%)	3685 (97%)	122 (3%)	2 (0%)	50	77

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	520	VAL
2	B	328	ILE

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	526/547 (96%)	511 (97%)	15 (3%)	37	62
2	B	942/1111 (85%)	901 (96%)	41 (4%)	24	51
2	C	942/1111 (85%)	907 (96%)	35 (4%)	29	55
2	D	942/1111 (85%)	907 (96%)	35 (4%)	29	55
All	All	3352/3880 (86%)	3226 (96%)	126 (4%)	30	54

All (126) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	90	ASN
1	A	133	LEU
1	A	205	ASP
1	A	220	GLN
1	A	227	HIS
1	A	239	LEU
1	A	269	MET
1	A	343	CYS
1	A	373	HIS
1	A	384	TYR
1	A	433	THR
1	A	486	VAL
1	A	492	HIS
1	A	511	PHE
1	A	609	TRP
2	B	44	VAL
2	B	65	ILE
2	B	73	THR
2	B	96	ASN
2	B	140	VAL
2	B	166	TYR
2	B	203	HIS
2	B	206	ILE
2	B	238	LEU

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Mol	Chain	Res	Type
2	B	273	LEU
2	B	297	CYS
2	B	308	ILE
2	B	314	PHE
2	B	320	GLU
2	B	325	PHE
2	B	331	LEU
2	B	358	VAL
2	B	364	ILE
2	B	367	PHE
2	B	373	PHE
2	B	391	VAL
2	B	392	TYR
2	B	394	ASP
2	B	436	LYS
2	B	497	TYR
2	B	502	GLN
2	B	511	PHE
2	B	569	THR
2	B	595	THR
2	B	615	GLU
2	B	657	GLU
2	B	674	THR
2	B	701	VAL
2	B	719	THR
2	B	732	VAL
2	B	790	ILE
2	B	837	LEU
2	B	874	LEU
2	B	994	THR
2	B	1036	VAL
2	B	1079	HIS
2	C	38	LYS
2	C	77	ASP
2	C	101	TRP
2	C	103	PHE
2	C	153	PHE
2	C	164	PHE
2	C	187	GLU
2	C	216	PHE
2	C	234	PHE
2	C	236	THR

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Mol	Chain	Res	Type
2	C	263	VAL
2	C	289	LEU
2	C	308	ILE
2	C	330	ASN
2	C	342	THR
2	C	365	TYR
2	C	433	ASN
2	C	436	LYS
2	C	511	PHE
2	C	595	THR
2	C	628	THR
2	C	652	VAL
2	C	672	THR
2	C	700	SER
2	C	701	VAL
2	C	704	SER
2	C	719	THR
2	C	787	THR
2	C	903	ASN
2	C	930	ILE
2	C	965	LYS
2	C	972	VAL
2	C	981	ASP
2	C	983	VAL
2	C	1101	THR
2	D	43	SER
2	D	81	LEU
2	D	91	SER
2	D	128	CYS
2	D	199	ILE
2	D	206	ILE
2	D	224	ASP
2	D	234	PHE
2	D	238	LEU
2	D	298	THR
2	D	302	PHE
2	D	303	THR
2	D	308	ILE
2	D	346	VAL
2	D	353	ARG
2	D	378	VAL
2	D	388	PHE

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Mol	Chain	Res	Type
2	D	457	LEU
2	D	520	VAL
2	D	530	VAL
2	D	535	VAL
2	D	581	LEU
2	D	587	SER
2	D	616	VAL
2	D	628	THR
2	D	728	THR
2	D	855	THR
2	D	874	LEU
2	D	930	ILE
2	D	946	ASP
2	D	972	VAL
2	D	983	VAL
2	D	1036	VAL
2	D	1079	HIS
2	D	1132	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (36) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	96	GLN
1	A	373	HIS
1	A	377	HIS
1	A	521	GLN
1	A	545	ASN
2	B	63	HIS
2	B	84	ASN
2	B	241	HIS
2	B	317	GLN
2	B	390	ASN
2	B	532	ASN
2	B	603	GLN
2	B	671	GLN
2	B	677	HIS
2	B	897	GLN
2	B	956	ASN
2	B	998	GLN
2	B	1079	HIS
2	B	1102	GLN
2	C	23	GLN

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Mol	Chain	Res	Type
2	C	131	GLN
2	C	267	GLN
2	C	366	ASN
2	C	410	GLN
2	C	413	ASN
2	C	435	ASN
2	C	961	GLN
2	D	118	ASN
2	D	134	ASN
2	D	241	HIS
2	D	405	GLN
2	D	444	ASN
2	D	552	ASN
2	D	640	GLN
2	D	706	ASN
2	D	1102	GLN

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 ⓘ

26 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	$\#\|Z\|>2$
3	NAG	B	1301	2	14,14,15	0.40	0	17,19,21	0.48	0
3	NAG	D	1302	2	14,14,15	0.41	0	17,19,21	0.44	0
3	NAG	C	1302	2	14,14,15	0.39	0	17,19,21	0.39	0
3	NAG	D	1305	-	14,14,15	0.39	0	17,19,21	0.37	0
3	NAG	C	1309	2	14,14,15	0.38	0	17,19,21	0.41	0
3	NAG	D	1309	-	14,14,15	0.40	0	17,19,21	0.40	0
3	NAG	B	1302	2	14,14,15	0.38	0	17,19,21	0.50	0
3	NAG	B	1305	2	14,14,15	0.39	0	17,19,21	0.40	0
3	NAG	C	1304	-	14,14,15	0.40	0	17,19,21	0.41	0
3	NAG	A	701	1	14,14,15	0.40	0	17,19,21	0.47	0
3	NAG	D	1304	-	14,14,15	0.39	0	17,19,21	0.79	1 (5%)
3	NAG	B	1304	2	14,14,15	0.39	0	17,19,21	0.51	0
3	NAG	C	1305	2	14,14,15	0.40	0	17,19,21	0.47	0
3	NAG	D	1308	2	14,14,15	0.39	0	17,19,21	0.75	1 (5%)
3	NAG	A	703	1	14,14,15	0.37	0	17,19,21	0.76	1 (5%)
3	NAG	C	1303	-	14,14,15	0.39	0	17,19,21	0.81	1 (5%)
3	NAG	D	1303	2	14,14,15	0.38	0	17,19,21	0.48	0
3	NAG	B	1303	-	14,14,15	0.39	0	17,19,21	2.10	2 (11%)
3	NAG	C	1307	2	14,14,15	0.40	0	17,19,21	0.42	0
3	NAG	A	702	-	14,14,15	0.40	0	17,19,21	0.40	0
3	NAG	C	1301	2	14,14,15	0.38	0	17,19,21	0.72	0
3	NAG	D	1307	2	14,14,15	0.40	0	17,19,21	0.46	0
3	NAG	D	1301	-	14,14,15	0.38	0	17,19,21	0.39	0
3	NAG	C	1308	2	14,14,15	0.39	0	17,19,21	0.45	0
3	NAG	D	1306	2	14,14,15	0.39	0	17,19,21	0.50	0
3	NAG	C	1306	2	14,14,15	0.38	0	17,19,21	0.81	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
3	NAG	B	1301	2	-	0/6/23/26	0/1/1/1
3	NAG	D	1302	2	-	2/6/23/26	0/1/1/1
3	NAG	C	1302	2	-	2/6/23/26	0/1/1/1
3	NAG	D	1305	-	-	0/6/23/26	0/1/1/1
3	NAG	C	1309	2	-	0/6/23/26	0/1/1/1
3	NAG	D	1309	-	-	0/6/23/26	0/1/1/1
3	NAG	B	1302	2	-	0/6/23/26	0/1/1/1
3	NAG	B	1305	2	-	0/6/23/26	0/1/1/1

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	NAG	C	1304	-	-	0/6/23/26	0/1/1/1
3	NAG	A	701	1	-	2/6/23/26	0/1/1/1
3	NAG	D	1304	-	-	2/6/23/26	0/1/1/1
3	NAG	B	1304	2	-	0/6/23/26	0/1/1/1
3	NAG	C	1305	2	-	0/6/23/26	0/1/1/1
3	NAG	D	1308	2	-	3/6/23/26	0/1/1/1
3	NAG	A	703	1	-	2/6/23/26	0/1/1/1
3	NAG	C	1303	-	-	3/6/23/26	0/1/1/1
3	NAG	D	1303	2	-	2/6/23/26	0/1/1/1
3	NAG	B	1303	-	-	4/6/23/26	0/1/1/1
3	NAG	C	1307	2	-	0/6/23/26	0/1/1/1
3	NAG	A	702	-	-	0/6/23/26	0/1/1/1
3	NAG	C	1301	2	-	3/6/23/26	0/1/1/1
3	NAG	D	1307	2	-	0/6/23/26	0/1/1/1
3	NAG	D	1301	-	-	0/6/23/26	0/1/1/1
3	NAG	C	1308	2	-	0/6/23/26	0/1/1/1
3	NAG	D	1306	2	-	0/6/23/26	0/1/1/1
3	NAG	C	1306	2	-	2/6/23/26	0/1/1/1

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	B	1303	NAG	C2-N2-C7	7.67	133.18	122.90
3	B	1303	NAG	C1-C2-N2	3.54	116.01	110.43
3	C	1303	NAG	C2-N2-C7	2.54	126.31	122.90
3	D	1304	NAG	C2-N2-C7	2.46	126.20	122.90
3	A	703	NAG	C2-N2-C7	2.45	126.18	122.90
3	C	1306	NAG	C2-N2-C7	2.42	126.15	122.90
3	D	1308	NAG	C2-N2-C7	2.38	126.09	122.90

There are no chirality outliers.

All (27) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	A	701	NAG	C8-C7-N2-C2
3	A	701	NAG	O7-C7-N2-C2
3	B	1303	NAG	C8-C7-N2-C2
3	B	1303	NAG	O7-C7-N2-C2

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Mol	Chain	Res	Type	Atoms
3	C	1301	NAG	C8-C7-N2-C2
3	C	1301	NAG	O7-C7-N2-C2
3	C	1302	NAG	C8-C7-N2-C2
3	C	1302	NAG	O7-C7-N2-C2
3	D	1302	NAG	C8-C7-N2-C2
3	D	1302	NAG	O7-C7-N2-C2
3	D	1303	NAG	C8-C7-N2-C2
3	D	1303	NAG	O7-C7-N2-C2
3	C	1301	NAG	O5-C5-C6-O6
3	C	1303	NAG	O5-C5-C6-O6
3	D	1308	NAG	O5-C5-C6-O6
3	A	703	NAG	C3-C2-N2-C7
3	C	1303	NAG	C3-C2-N2-C7
3	C	1306	NAG	C3-C2-N2-C7
3	D	1304	NAG	C3-C2-N2-C7
3	D	1308	NAG	C3-C2-N2-C7
3	A	703	NAG	C1-C2-N2-C7
3	B	1303	NAG	C1-C2-N2-C7
3	C	1303	NAG	C1-C2-N2-C7
3	C	1306	NAG	C1-C2-N2-C7
3	D	1304	NAG	C1-C2-N2-C7
3	D	1308	NAG	C1-C2-N2-C7
3	B	1303	NAG	C3-C2-N2-C7

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	1308	NAG	1	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 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 1301

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG D 1302

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 1302

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG D 1305

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 1309

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG D 1309

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 1302

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 1305

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 1304

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG A 701

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG D 1304

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 1304

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 1305

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG D 1308

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG A 703

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 1303

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG D 1303

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG B 1303

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 1307

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG A 702

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 1301

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG D 1307

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG D 1301

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 1308

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG D 1306

Bond lengths

Bond angles

Torsions

Rings

Ligand NAG C 1306

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 (i)

This section contains visualisations of the EMDB entry EMD-72207. These allow visual inspection of the internal detail of the map and identification of artifacts.

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

6.1 Orthogonal projections (i)

6.1.1 Primary map
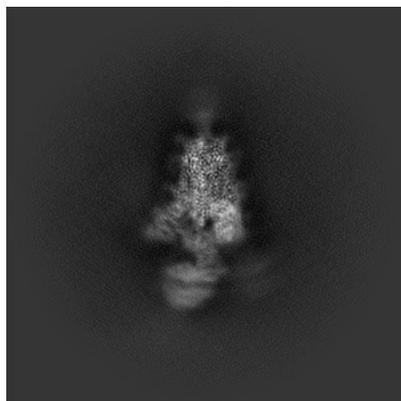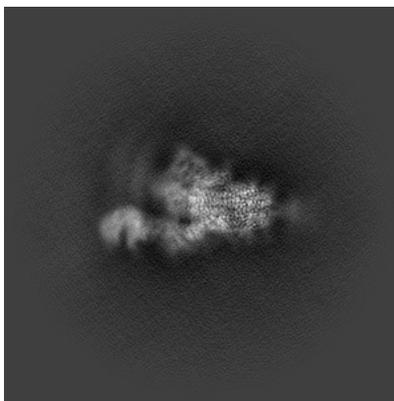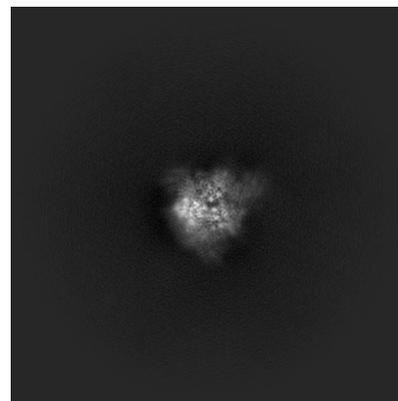
X Y Z

6.1.2 Raw map

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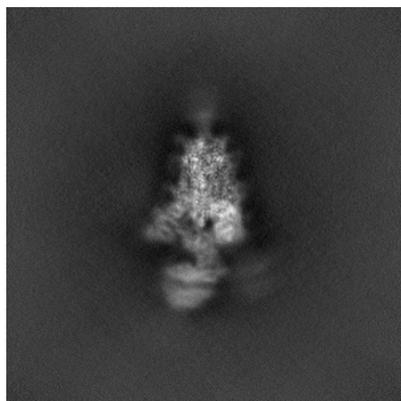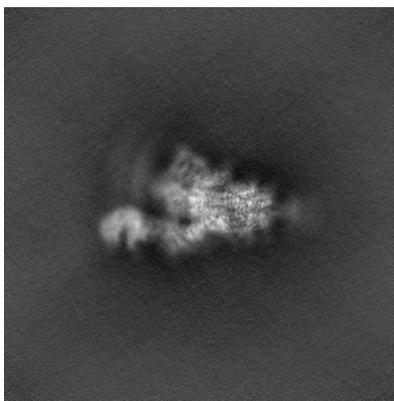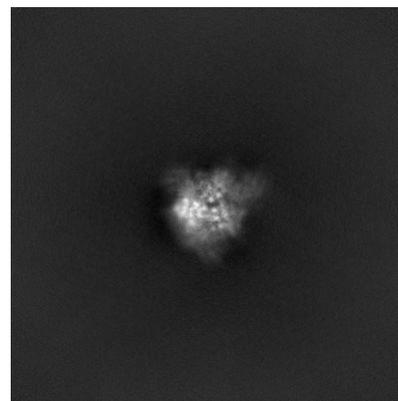
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
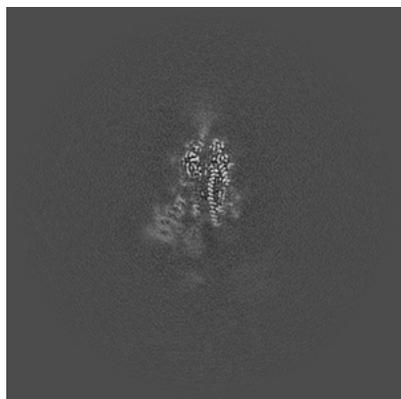
6.2.1 Primary map

X Index: 300
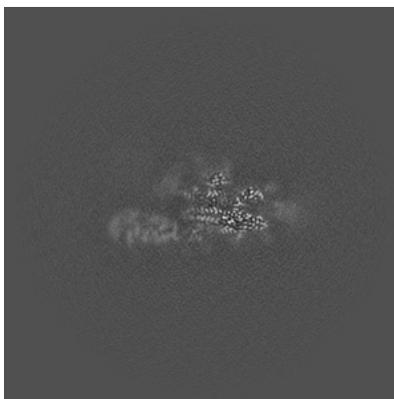
Y Index: 300
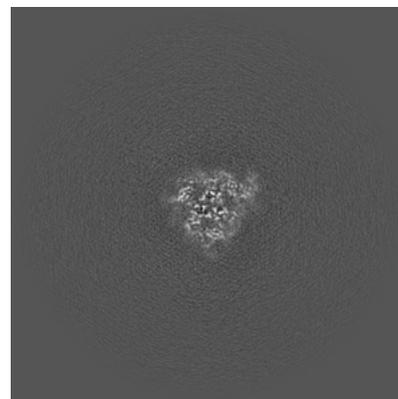
Z Index: 300

6.2.2 Raw map

X Index: 300

Y Index: 300
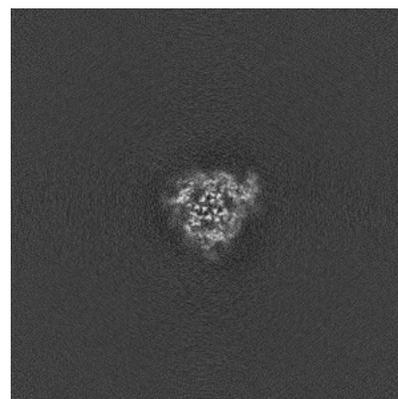
Z Index: 300

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

6.3 Largest variance slices ⓘ

6.3.1 Primary map
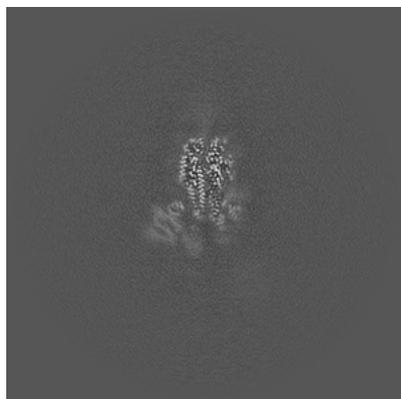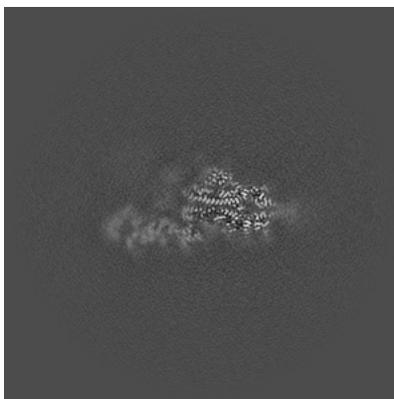
X Index: 306	Y Index: 293	Z Index: 369
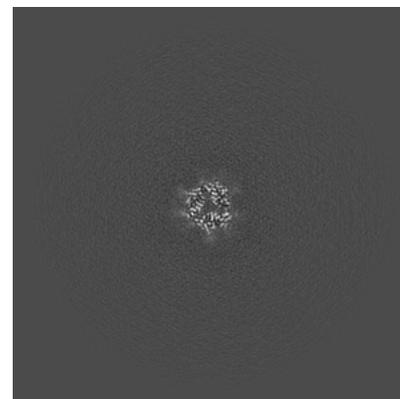
6.3.2 Raw map

X Index: 306	Y Index: 295	Z Index: 298
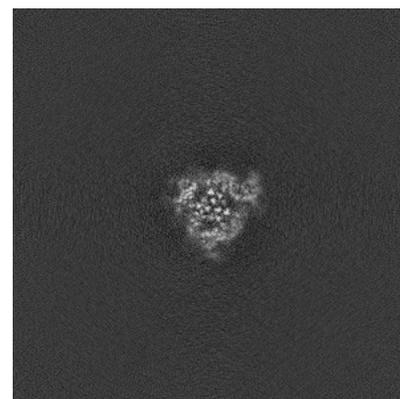
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map
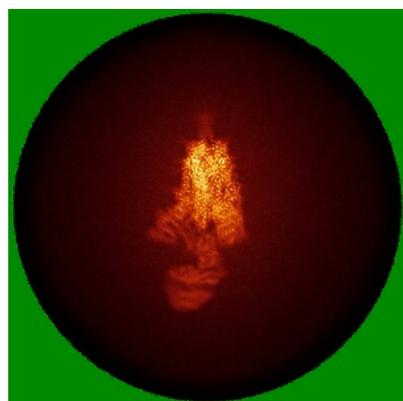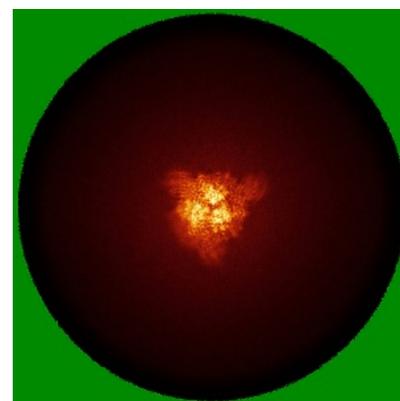
X	Y	Z

6.4.2 Raw map

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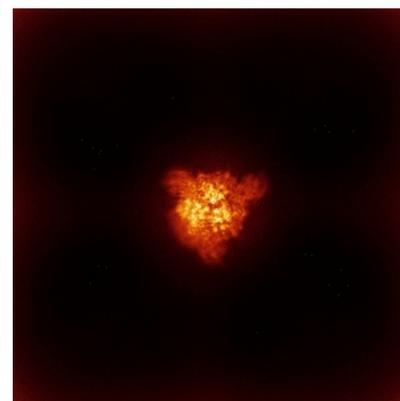
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views (i)

6.5.1 Primary map

X   Y   Z

The images above show the 3D surface view of the map at the recommended contour level 0.25. 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 shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

A mask typically either:

- Encompasses the whole structure

- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

6.6.1 emd_72207_msk_1.map ⓘ

X   Y   Z
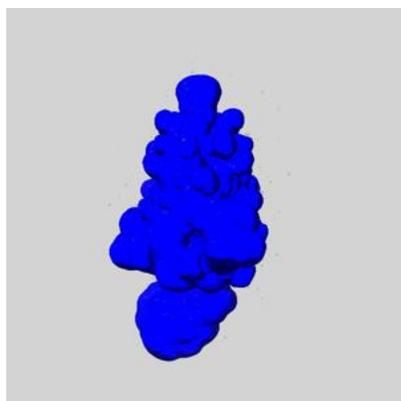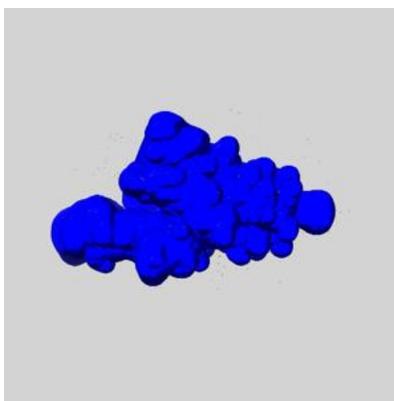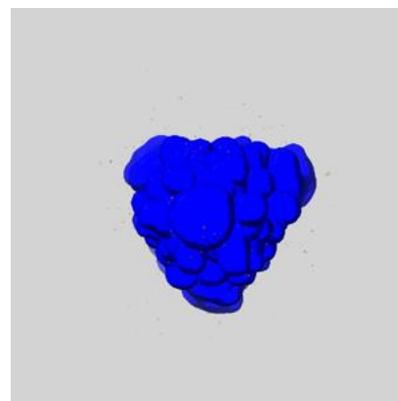
7 Map analysis ⓘ

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 ⓘ
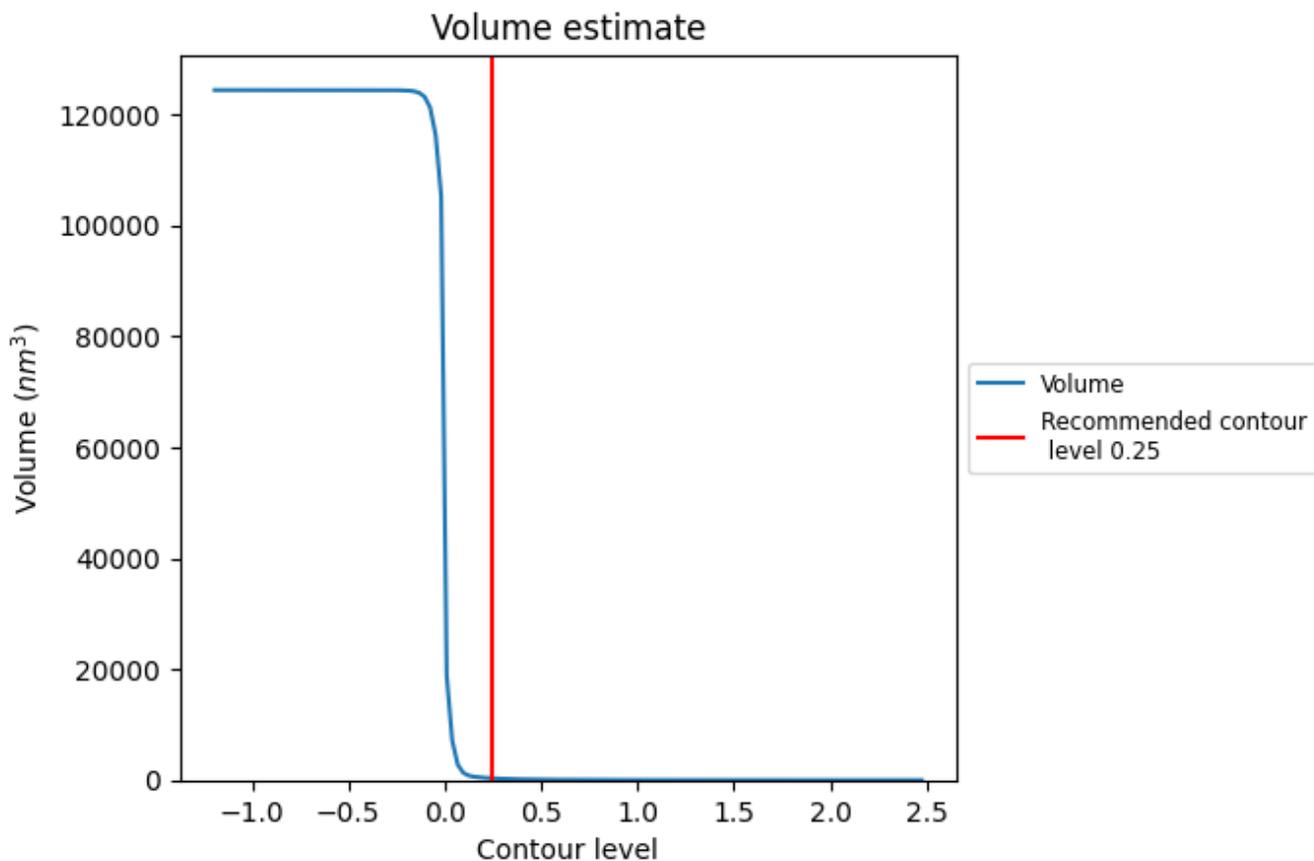
The volume at the recommended contour level is 321 nm^3; this corresponds to an approximate mass of 290 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum (i)
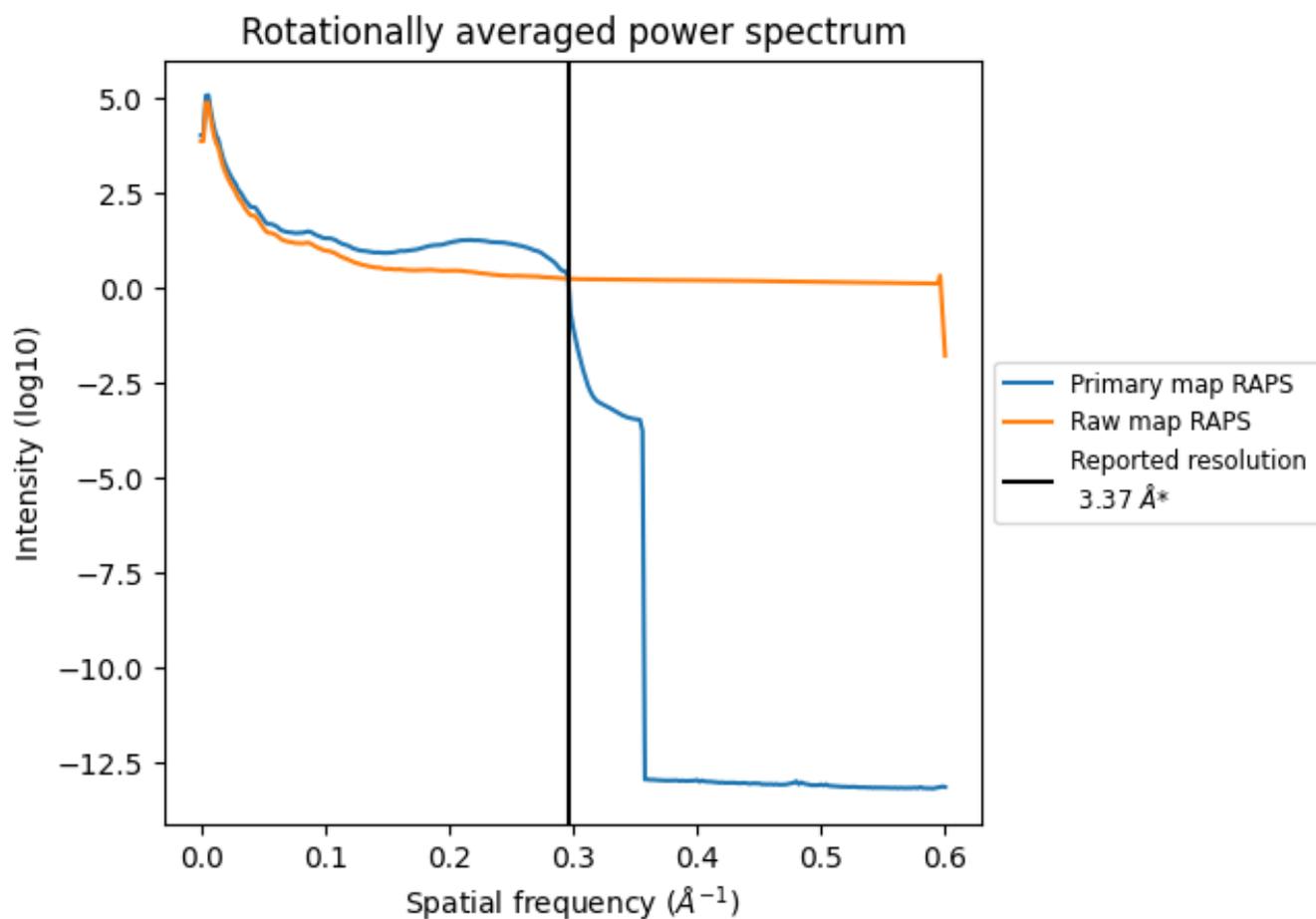
*Reported resolution corresponds to spatial frequency of 0.297 Å^{-1}

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 ⓘ
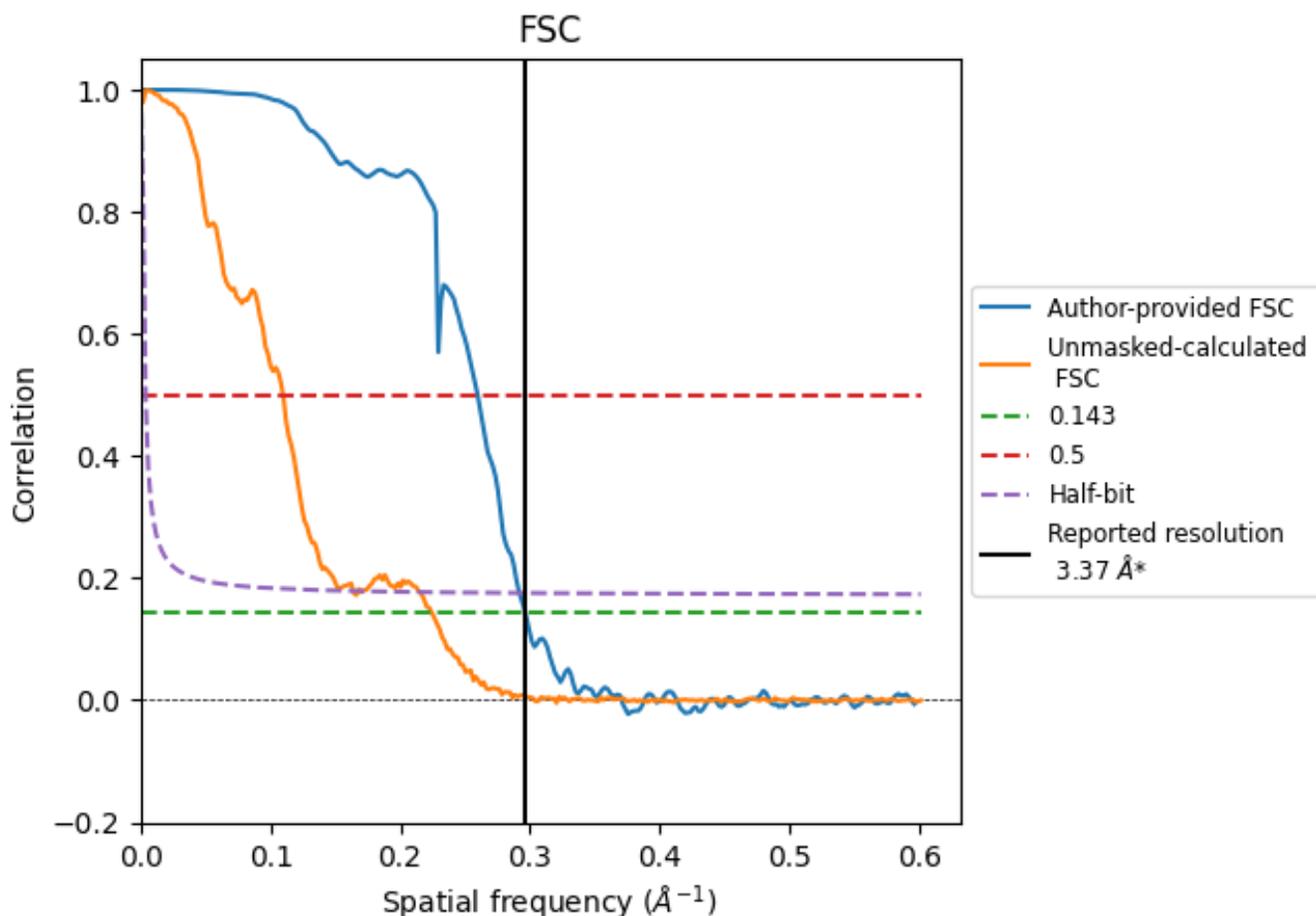
*Reported resolution corresponds to spatial frequency of 0.297 Å^{-1}

8.2 Resolution estimates (i)

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.37	-	-
Author-provided FSC curve	3.37	3.85	3.43
Unmasked-calculated*	4.45	9.11	6.11

*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 4.45 differs from the reported value 3.37 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-72207 and PDB model 9Q3U. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay ⓘ


X	Y	Z
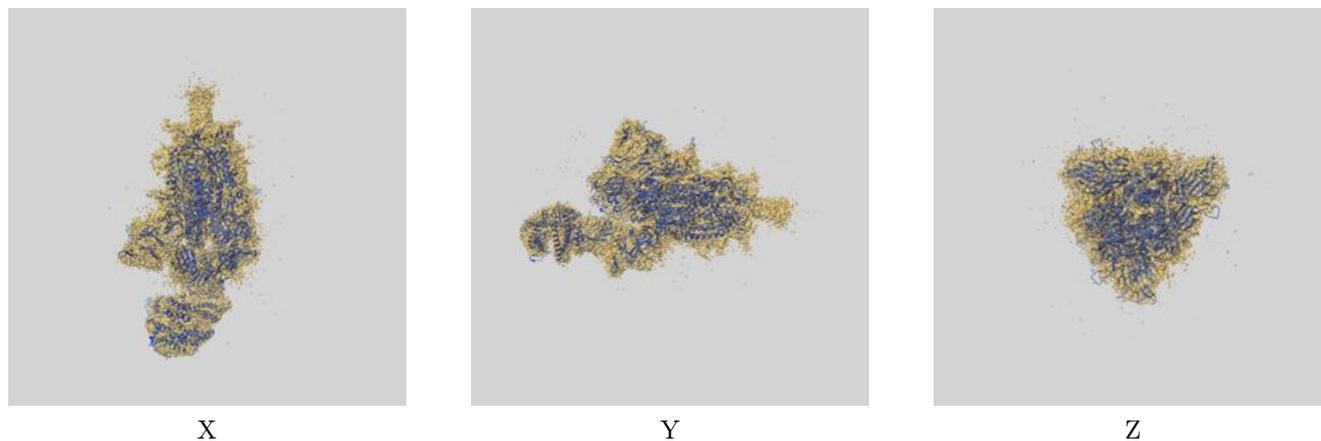
The images above show the 3D surface view of the map at the recommended contour level 0.25 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model ⓘ

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 ⓘ
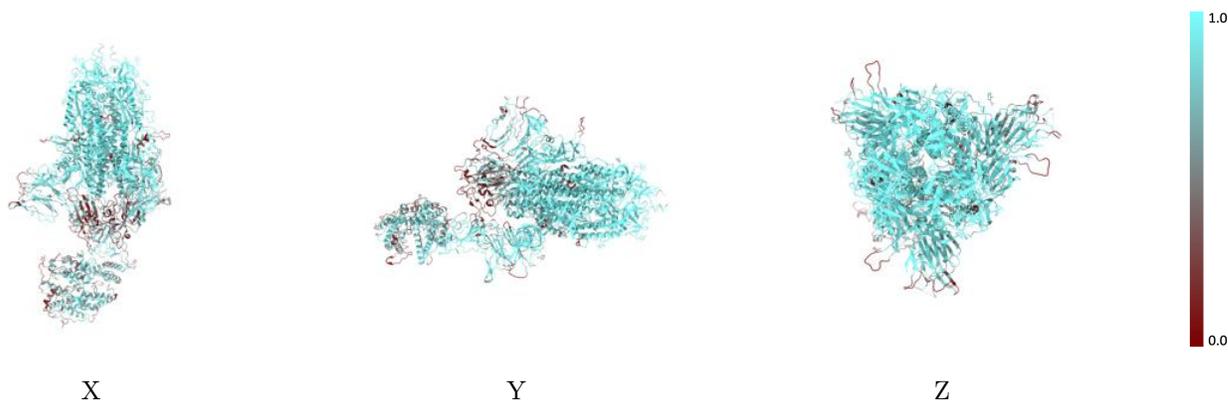
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.25).

9.4   Atom inclusion ⓘ
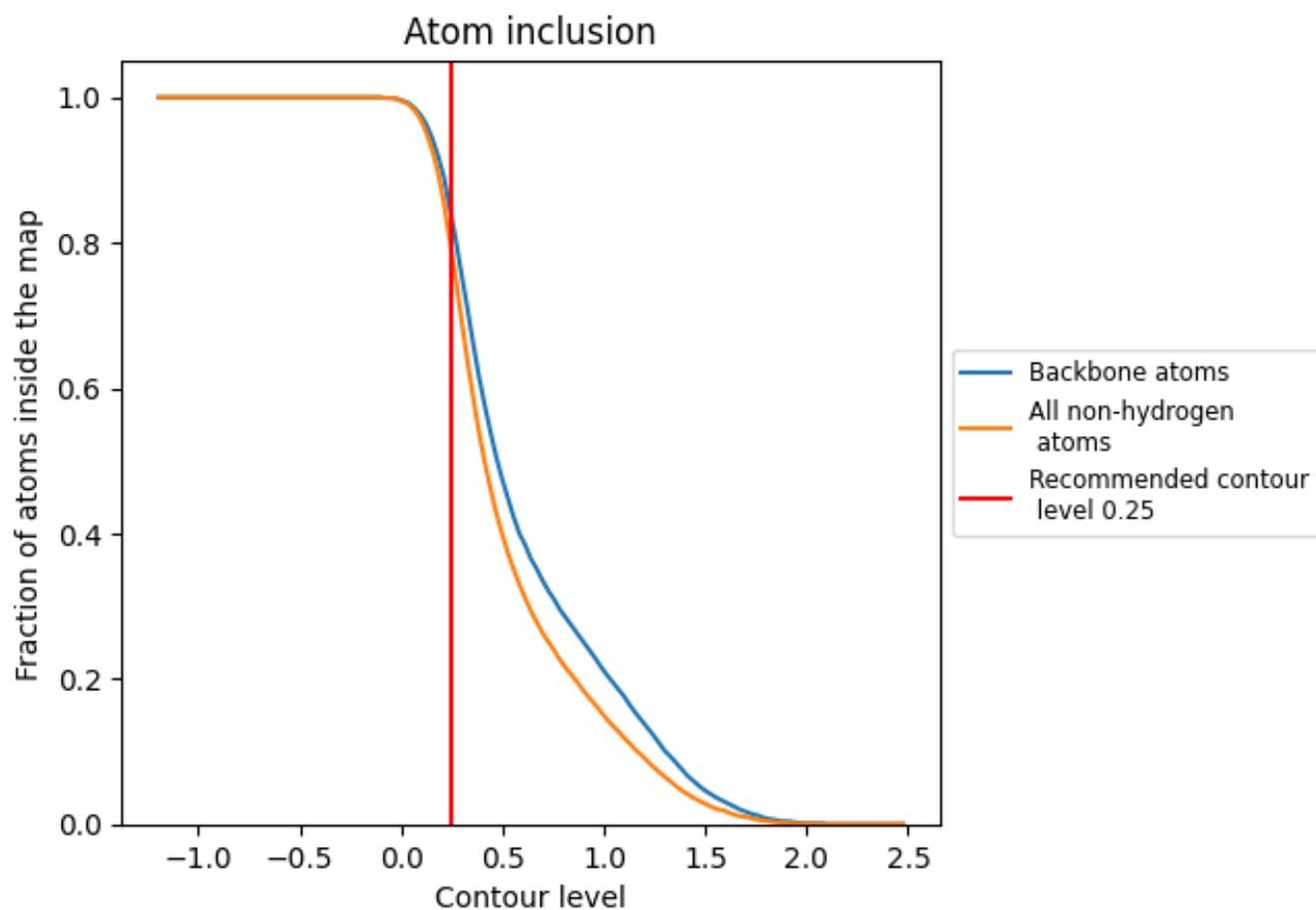
At the recommended contour level, 83% of all backbone atoms, 79% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.25) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7860	0.3590
A	0.6310	0.1340
B	0.8650	0.4070
C	0.7830	0.3950
D	0.7990	0.4050

1.0

0.0

<0.0