WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report ⓘ

Feb 24, 2024 – 10:33 PM EST

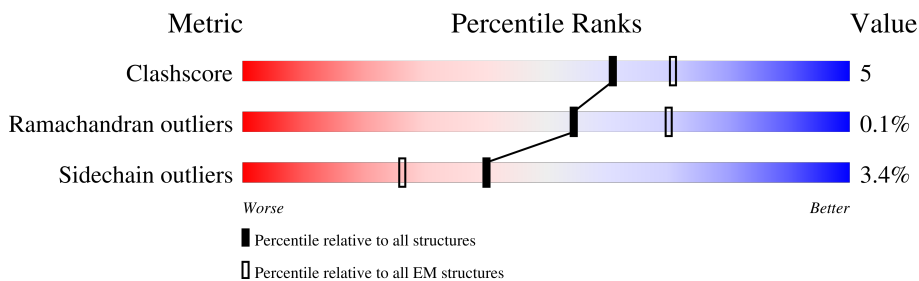|		
PDB ID	:	7L70
EMDB ID	:	EMD-23209
Title	:	The eukaryotic translation initiation factor 2B from Homo sapiens in its apo form
Authors	:	Wang, L.; Schoof, M.; Lawrence, R.; Boone, M.; Frost, A.; Walter, P.
Deposited on	:	2020-12-24
Resolution	:	2.80 Å(reported)

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 2.80 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.
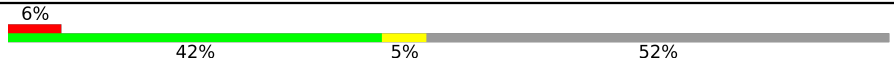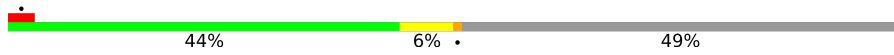
Metric	Percentile Ranks	Value
Clashscore		5
Ramachandran outliers		0.1%
Sidechain outliers		3.4%

Worse   *Better*

▮ Percentile relative to all structures

▯ Percentile relative to all EM structures

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	721	49% 7% · 43%
1	B	721	48% 8% · 43%
2	C	368	79% 7% 14%
2	D	368	77% 9% 14%
3	E	523	62% 6% 33%
3	F	523	60% 6% 34%
4	G	322	70% 10% · 18%
4	H	322	73% 8% · 17%

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Mol	Chain	Length	Quality of chain
5	I	452	6% 42% 5% 52%
5	J	452	44% 6% 49%

2 Entry composition ⓘ

There are 5 unique types of molecules in this entry. The entry contains 24187 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 Translation initiation factor eIF-2B subunit epsilon.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	414	Total 3195	C 2023	N 568	O 589	S 15	0	0
1	B	414	Total 3195	C 2023	N 568	O 589	S 15	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	587	VAL	ILE	conflict	UNP Q13144
B	587	VAL	ILE	conflict	UNP Q13144

- Molecule 2 is a protein called Translation initiation factor eIF-2B subunit beta.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	C	318	Total 2479	C 1568	N 438	O 458	S 15	0	0
2	D	318	Total 2472	C 1565	N 437	O 455	S 15	0	0

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-16	MET	-	initiating methionine	UNP P49770
C	-15	HIS	-	expression tag	UNP P49770
C	-14	HIS	-	expression tag	UNP P49770
C	-13	HIS	-	expression tag	UNP P49770
C	-12	HIS	-	expression tag	UNP P49770
C	-11	HIS	-	expression tag	UNP P49770
C	-10	HIS	-	expression tag	UNP P49770
C	-9	GLY	-	expression tag	UNP P49770
C	-8	GLY	-	expression tag	UNP P49770
C	-7	GLY	-	expression tag	UNP P49770
C	-6	SER	-	expression tag	UNP P49770

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-5	GLU	-	expression tag	UNP P49770
C	-4	ASN	-	expression tag	UNP P49770
C	-3	LEU	-	expression tag	UNP P49770
C	-2	TYR	-	expression tag	UNP P49770
C	-1	PHE	-	expression tag	UNP P49770
C	0	GLN	-	expression tag	UNP P49770
C	1	SER	-	expression tag	UNP P49770
D	-16	MET	-	initiating methionine	UNP P49770
D	-15	HIS	-	expression tag	UNP P49770
D	-14	HIS	-	expression tag	UNP P49770
D	-13	HIS	-	expression tag	UNP P49770
D	-12	HIS	-	expression tag	UNP P49770
D	-11	HIS	-	expression tag	UNP P49770
D	-10	HIS	-	expression tag	UNP P49770
D	-9	GLY	-	expression tag	UNP P49770
D	-8	GLY	-	expression tag	UNP P49770
D	-7	GLY	-	expression tag	UNP P49770
D	-6	SER	-	expression tag	UNP P49770
D	-5	GLU	-	expression tag	UNP P49770
D	-4	ASN	-	expression tag	UNP P49770
D	-3	LEU	-	expression tag	UNP P49770
D	-2	TYR	-	expression tag	UNP P49770
D	-1	PHE	-	expression tag	UNP P49770
D	0	GLN	-	expression tag	UNP P49770
D	1	SER	-	expression tag	UNP P49770

- Molecule 3 is a protein called Translation initiation factor eIF-2B subunit delta.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	E	351	Total 2734	C 1730	N 487	O 503	S 14	0	0
3	F	346	Total 2693	C 1704	N 478	O 497	S 14	0	0

- Molecule 4 is a protein called Translation initiation factor eIF-2B subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	G	265	Total 1977	C 1275	N 330	O 361	S 11	0	0
4	H	266	Total 1966	C 1268	N 328	O 360	S 10	0	0

There are 36 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	-16	MET	-	initiating methionine	UNP Q14232
G	-15	HIS	-	expression tag	UNP Q14232
G	-14	HIS	-	expression tag	UNP Q14232
G	-13	HIS	-	expression tag	UNP Q14232
G	-12	HIS	-	expression tag	UNP Q14232
G	-11	HIS	-	expression tag	UNP Q14232
G	-10	HIS	-	expression tag	UNP Q14232
G	-9	GLY	-	expression tag	UNP Q14232
G	-8	GLY	-	expression tag	UNP Q14232
G	-7	GLY	-	expression tag	UNP Q14232
G	-6	SER	-	expression tag	UNP Q14232
G	-5	GLU	-	expression tag	UNP Q14232
G	-4	ASN	-	expression tag	UNP Q14232
G	-3	LEU	-	expression tag	UNP Q14232
G	-2	TYR	-	expression tag	UNP Q14232
G	-1	PHE	-	expression tag	UNP Q14232
G	0	GLN	-	expression tag	UNP Q14232
G	1	SER	-	expression tag	UNP Q14232
H	-16	MET	-	initiating methionine	UNP Q14232
H	-15	HIS	-	expression tag	UNP Q14232
H	-14	HIS	-	expression tag	UNP Q14232
H	-13	HIS	-	expression tag	UNP Q14232
H	-12	HIS	-	expression tag	UNP Q14232
H	-11	HIS	-	expression tag	UNP Q14232
H	-10	HIS	-	expression tag	UNP Q14232
H	-9	GLY	-	expression tag	UNP Q14232
H	-8	GLY	-	expression tag	UNP Q14232
H	-7	GLY	-	expression tag	UNP Q14232
H	-6	SER	-	expression tag	UNP Q14232
H	-5	GLU	-	expression tag	UNP Q14232
H	-4	ASN	-	expression tag	UNP Q14232
H	-3	LEU	-	expression tag	UNP Q14232
H	-2	TYR	-	expression tag	UNP Q14232
H	-1	PHE	-	expression tag	UNP Q14232
H	0	GLN	-	expression tag	UNP Q14232
H	1	SER	-	expression tag	UNP Q14232

- Molecule 5 is a protein called Translation initiation factor eIF-2B subunit gamma.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	I	215	1682	1094	284	291	13	0	0

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| Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	J	229	1794	1164	303	312	15	0	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: Translation initiation factor eIF-2B subunit epsilon
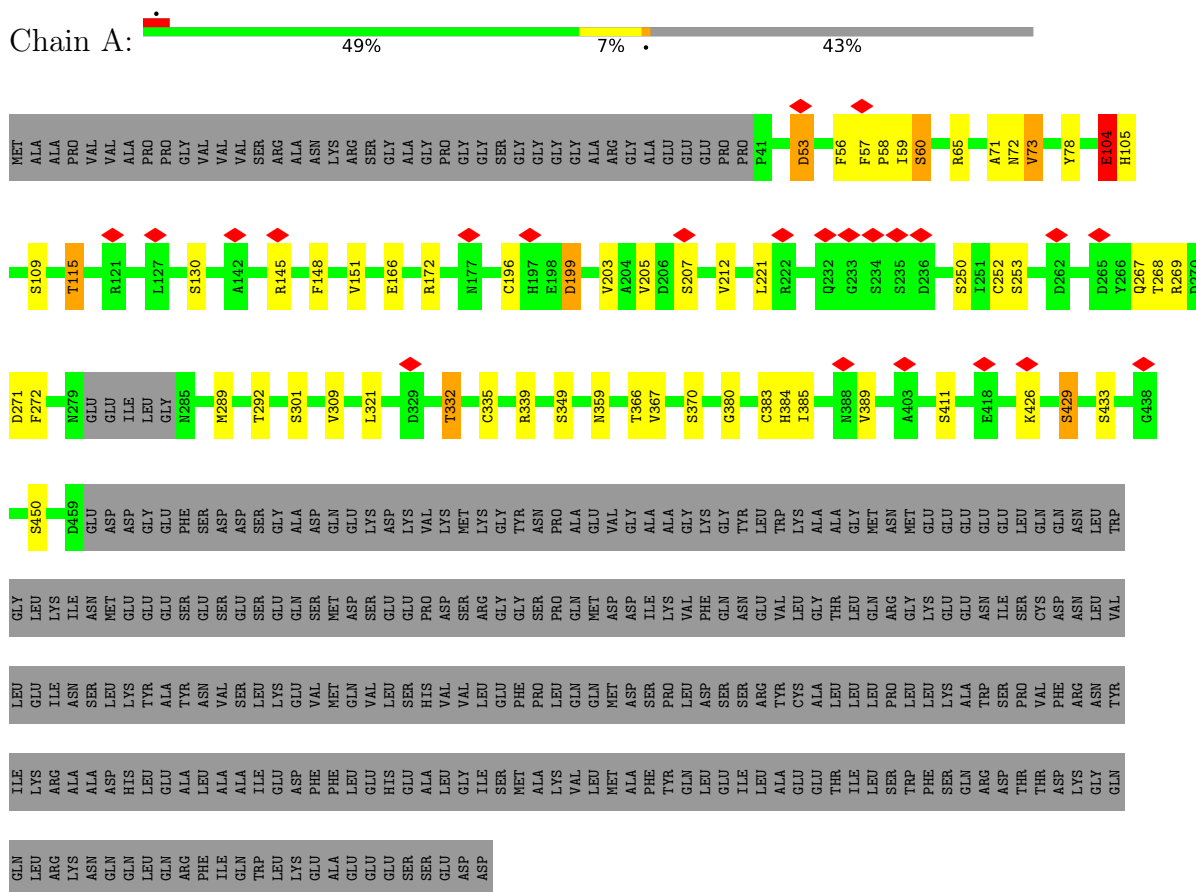
Chain A:

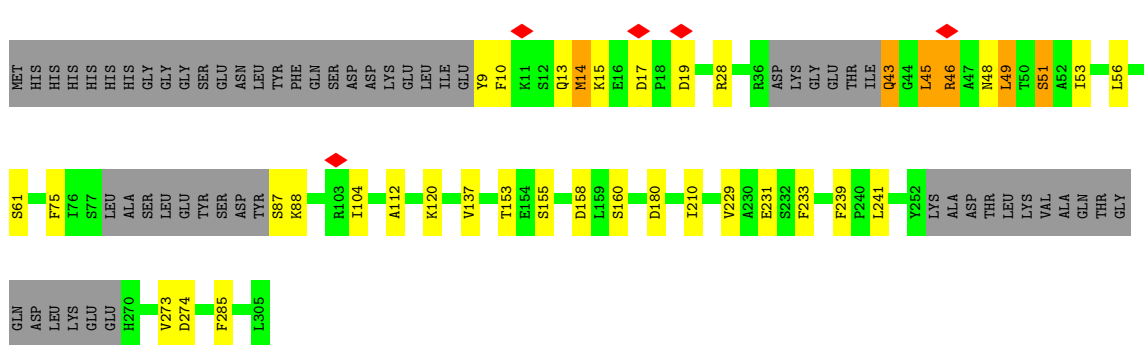• Molecule 1: Translation initiation factor eIF-2B subunit epsilon

Chain B:

• Molecule 2: Translation initiation factor eIF-2B subunit beta

Chain C:

• Molecule 2: Translation initiation factor eIF-2B subunit beta

Chain D:

• Molecule 3: Translation initiation factor eIF-2B subunit delta

Chain E:

• Molecule 3: Translation initiation factor eIF-2B subunit delta

Chain F: 60% 6% 34%

• Molecule 4: Translation initiation factor eIF-2B subunit alpha

Chain G: 70% 10% • 18%

• Molecule 4: Translation initiation factor eIF-2B subunit alpha

Chain H: 73% 8% • 17%

• Molecule 5: Translation initiation factor eIF-2B subunit gamma

Chain I:

• Molecule 5: Translation initiation factor eIF-2B subunit gamma

Chain J:
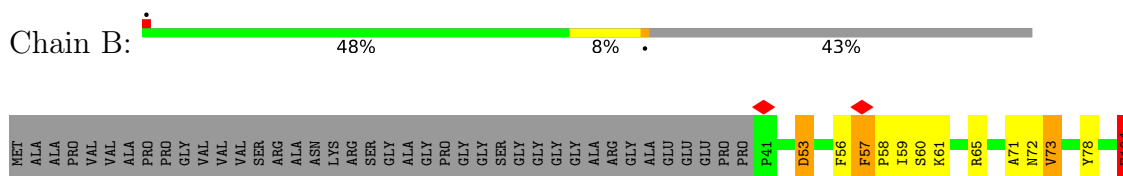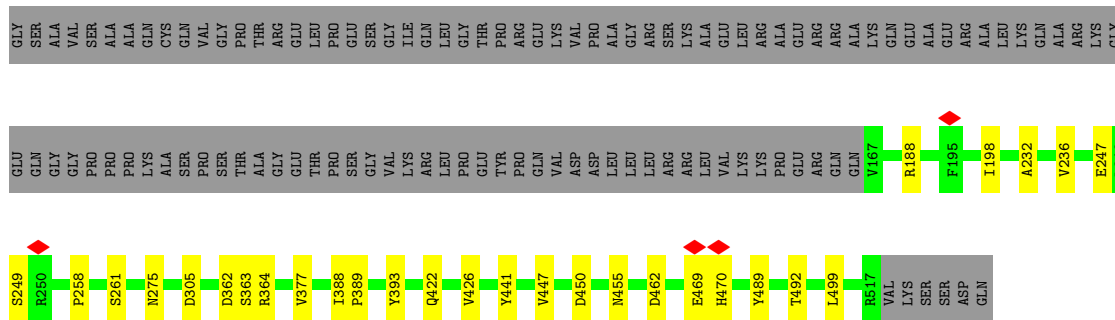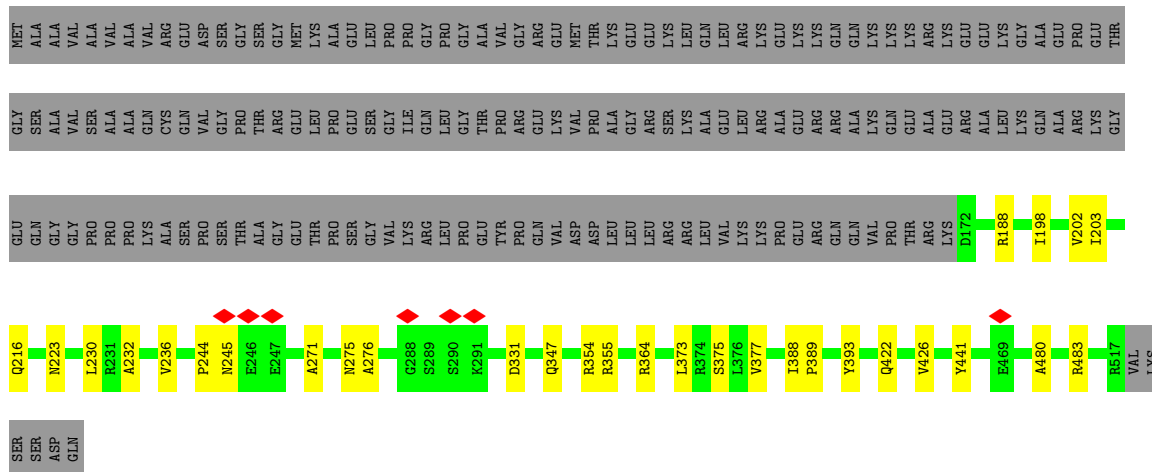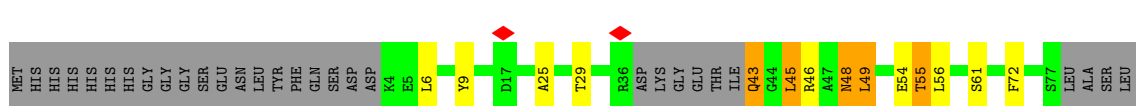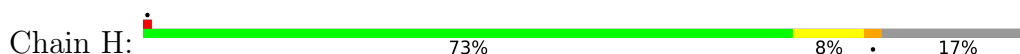
GLN LEU MET GLU ILE

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	461805	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 $(e^-/\text{Å}^2)$	67	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	2.693	Depositor
Minimum map value	-1.422	Depositor
Average map value	0.003	Depositor
Map value standard deviation	0.073	Depositor
Recommended contour level	0.5	Depositor
Map size (Å)	334.0, 334.0, 334.0	wwPDB
Map dimensions	400, 400, 400	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.835, 0.835, 0.835	Depositor

5   Model quality ⓘ

5.1   Standard geometry ⓘ

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	0.25	0/3262	0.48	1/4446 (0.0%)
1	B	0.25	0/3262	0.48	1/4446 (0.0%)
2	C	0.24	0/2526	0.40	0/3417
2	D	0.24	0/2519	0.40	0/3408
3	E	0.24	0/2786	0.39	0/3787
3	F	0.24	0/2744	0.40	0/3730
4	G	0.33	0/2009	0.52	2/2721 (0.1%)
4	H	0.33	0/1997	0.44	0/2711
5	I	0.24	0/1708	0.40	0/2304
5	J	0.24	0/1823	0.42	0/2461
All	All	0.26	0/24636	0.44	4/33431 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand.A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	B	0	1
All	All	0	2

There are no bond length outliers.

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	G	49	LEU	CB-CG-CD2	6.36	121.82	111.00
1	A	104	GLU	CA-CB-CG	6.03	126.66	113.40
1	B	104	GLU	CA-CB-CG	6.02	126.64	113.40
4	G	49	LEU	CB-CG-CD1	6.01	121.21	111.00

There are no chirality outliers.

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All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	57	PHE	Peptide
1	B	57	PHE	Peptide

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	3195	0	3142	29	0
1	B	3195	0	3142	31	0
2	C	2479	0	2494	19	0
2	D	2472	0	2486	17	0
3	E	2734	0	2794	17	0
3	F	2693	0	2745	17	0
4	G	1977	0	1986	46	0
4	H	1966	0	1955	31	0
5	I	1682	0	1748	14	0
5	J	1794	0	1856	18	0
All	All	24187	0	24348	225	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 5.

All (225) 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:H:49:LEU:HD11	4:H:72:PHE:HE2	1.23	1.04
4:H:49:LEU:CD1	4:H:72:PHE:HE2	1.74	0.98
4:G:48:ASN:O	4:G:51:SER:OG	1.82	0.95
4:G:14:MET:HE2	4:G:28:ARG:HB2	1.48	0.93
4:H:46:ARG:HH11	4:H:46:ARG:HB2	1.34	0.92
4:G:14:MET:HE2	4:G:28:ARG:CB	2.00	0.91
4:G:43:GLN:HB2	4:G:87:SER:HB3	1.51	0.90
4:H:6:LEU:HD23	4:H:55:THR:OG1	1.72	0.89
1:A:53:ASP:OD2	1:A:65:ARG:NH1	2.05	0.89
4:G:14:MET:CE	4:G:28:ARG:HD3	2.02	0.89

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:53:ASP:OD2	1:B:65:ARG:NH1	2.05	0.88
4:G:14:MET:CE	4:G:28:ARG:CD	2.52	0.86
4:H:46:ARG:HB2	4:H:46:ARG:NH1	1.90	0.86
2:D:76:THR:HG1	2:D:238:THR:HG1	1.12	0.82
4:H:49:LEU:HD11	4:H:72:PHE:CE2	2.14	0.81
4:G:14:MET:CE	4:G:28:ARG:CB	2.58	0.80
1:A:205:VAL:HG11	1:A:289:MET:SD	2.22	0.80
4:G:46:ARG:HG3	4:G:46:ARG:HH11	1.47	0.79
4:H:43:GLN:HE21	4:H:43:GLN:N	1.81	0.79
4:G:14:MET:HE1	4:G:28:ARG:HB3	1.64	0.79
1:B:205:VAL:HG11	1:B:289:MET:SD	2.22	0.78
4:G:48:ASN:C	4:G:51:SER:HG	1.87	0.77
3:E:198:ILE:O	5:I:122:ARG:NH2	2.17	0.77
4:H:49:LEU:CD1	4:H:72:PHE:CE2	2.64	0.77
4:G:14:MET:HE2	4:G:28:ARG:HD3	1.64	0.77
4:G:14:MET:CE	4:G:28:ARG:HE	1.98	0.77
4:G:14:MET:CE	4:G:28:ARG:HB3	2.17	0.75
4:G:14:MET:CE	4:G:28:ARG:NE	2.50	0.75
4:G:14:MET:O	4:G:14:MET:HG3	1.86	0.74
4:G:14:MET:HE3	4:G:28:ARG:HE	1.52	0.74
5:J:328:LYS:O	5:J:331:SER:OG	2.05	0.74
4:G:14:MET:HE3	4:G:28:ARG:NE	2.04	0.72
1:A:130:SER:OG	1:A:267:GLN:O	2.03	0.72
4:G:46:ARG:HG3	4:G:46:ARG:NH1	2.04	0.72
1:B:130:SER:OG	1:B:267:GLN:O	2.03	0.71
2:D:247:ALA:HB3	2:D:251:THR:HG21	1.73	0.70
4:H:46:ARG:HH11	4:H:46:ARG:CB	2.04	0.70
4:H:178:VAL:HG11	4:H:186:ILE:HD13	1.74	0.69
5:I:169:PHE:HE2	5:I:171:ALA:HB2	1.58	0.69
3:E:188:ARG:NH1	3:E:462:ASP:OD2	2.27	0.67
4:G:14:MET:HE3	4:G:28:ARG:HD3	1.75	0.67
2:C:158:HIS:O	2:C:231:LYS:NZ	2.25	0.67
3:F:480:ALA:O	3:F:483:ARG:NH1	2.28	0.67
1:B:205:VAL:HG12	1:B:212:VAL:HA	1.75	0.67
2:D:193:GLU:OE2	3:E:364:ARG:NH1	2.27	0.66
4:G:43:GLN:HG3	4:G:87:SER:N	2.11	0.66
1:A:205:VAL:HG12	1:A:212:VAL:HA	1.75	0.66
1:B:339:ARG:NH2	3:F:393:TYR:O	2.29	0.66
4:G:14:MET:HE3	4:G:28:ARG:CD	2.25	0.66
4:G:45:LEU:HD13	4:G:45:LEU:O	1.96	0.65
4:H:9:TYR:HD1	4:H:29:THR:HG22	1.63	0.64

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:E:258:PRO:O	3:E:261:SER:OG	2.13	0.64
3:F:198:ILE:O	5:J:122:ARG:NH2	2.31	0.61
4:H:206:ILE:HG21	4:H:228:VAL:HG11	1.83	0.61
2:D:143:GLU:O	2:D:147:THR:HG23	2.01	0.61
3:F:271:ALA:O	3:F:275:ASN:ND2	2.33	0.61
1:A:339:ARG:NH2	3:E:393:TYR:O	2.34	0.61
4:H:48:ASN:C	4:H:48:ASN:HD22	2.02	0.60
4:H:6:LEU:HD21	4:H:56:LEU:HG	1.83	0.60
2:C:193:GLU:OE2	3:F:364:ARG:NH1	2.33	0.60
3:E:247:GLU:OE1	3:E:249:SER:N	2.35	0.59
2:D:128:GLN:O	2:D:132:ASN:ND2	2.35	0.59
5:J:158:ILE:HD11	5:J:196:HIS:HB2	1.84	0.59
5:I:102:LEU:HD13	5:I:206:CYS:SG	2.42	0.59
4:G:48:ASN:C	4:G:51:SER:OG	2.38	0.59
4:G:14:MET:HE2	4:G:28:ARG:CD	2.28	0.58
2:C:14:ARG:NH1	2:C:44:GLN:OE1	2.36	0.58
2:C:33:GLU:OE1	2:C:36:ARG:NH1	2.37	0.58
2:D:62:ARG:NH2	2:D:348:ASP:OD1	2.38	0.57
4:G:104:ILE:HD12	4:G:233:PHE:HD2	1.69	0.57
3:E:422:GLN:O	3:E:426:VAL:HG23	2.05	0.57
1:B:366:THR:OG1	1:B:380:GLY:O	2.23	0.57
5:I:30:VAL:HG21	5:I:35:LEU:HD13	1.85	0.57
1:A:172:ARG:NH1	1:A:253:SER:OG	2.38	0.56
1:B:172:ARG:NH1	1:B:253:SER:OG	2.38	0.56
1:A:366:THR:OG1	1:A:380:GLY:O	2.23	0.56
3:F:223:ASN:ND2	3:F:441:TYR:OH	2.38	0.56
4:H:6:LEU:CD2	4:H:55:THR:OG1	2.50	0.56
5:J:161:ASP:OD1	5:J:163:THR:N	2.38	0.56
4:H:6:LEU:HD23	4:H:55:THR:HG1	1.70	0.56
4:G:48:ASN:HA	4:G:51:SER:OG	2.05	0.56
1:B:315:ARG:NH1	2:C:303:LEU:O	2.38	0.56
2:C:323:LEU:HD11	3:E:447:VAL:HG11	1.88	0.55
5:J:158:ILE:HD13	5:J:158:ILE:H	1.72	0.55
2:D:159:ILE:O	2:D:185:ARG:NH1	2.40	0.55
2:C:302:ILE:HG22	3:F:377:VAL:HG11	1.89	0.54
2:D:283:ASP:O	2:D:284:SER:OG	2.20	0.54
1:B:104:GLU:OE2	1:B:105:HIS:N	2.41	0.54
1:A:104:GLU:OE2	1:A:105:HIS:N	2.41	0.54
5:I:99:THR:HG22	5:I:100:ASP:H	1.73	0.54
5:I:319:TYR:O	5:I:323:ASN:ND2	2.41	0.54
2:D:56:GLU:N	2:D:56:GLU:OE1	2.41	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:F:354:ARG:O	3:F:355:ARG:NH1	2.39	0.54
1:B:429:SER:O	1:B:429:SER:OG	2.27	0.53
4:H:6:LEU:HD11	4:H:56:LEU:HD11	1.90	0.53
1:B:411:SER:OG	1:B:426:LYS:O	2.27	0.53
1:A:411:SER:OG	1:A:426:LYS:O	2.27	0.52
5:I:130:MET:CG	5:I:302:VAL:HG22	2.40	0.52
5:J:161:ASP:OD1	5:J:163:THR:HG22	2.10	0.51
1:B:268:THR:OG1	1:B:269:ARG:N	2.44	0.50
1:A:203:VAL:HG12	1:A:205:VAL:HG13	1.93	0.50
4:G:48:ASN:CA	4:G:51:SER:OG	2.59	0.50
3:E:499:LEU:HD23	4:G:241:LEU:HD21	1.92	0.50
1:B:203:VAL:HG12	1:B:205:VAL:HG13	1.93	0.50
3:F:422:GLN:O	3:F:426:VAL:HG23	2.11	0.50
4:G:14:MET:HE1	4:G:28:ARG:HE	1.75	0.49
5:I:131:LEU:HB3	5:I:204:LEU:HD21	1.95	0.49
4:G:49:LEU:O	4:G:53:ILE:HG13	2.12	0.49
4:G:61:SER:O	4:G:61:SER:OG	2.26	0.49
1:A:268:THR:OG1	1:A:269:ARG:N	2.44	0.49
5:I:322:ALA:O	5:I:326:VAL:HG23	2.12	0.48
2:C:274:LEU:HD21	2:C:336:ILE:CG2	2.43	0.48
1:A:429:SER:O	1:A:429:SER:OG	2.27	0.48
5:J:179:GLU:N	5:J:179:GLU:OE1	2.47	0.48
2:C:11:LEU:HD21	2:C:45:ILE:HA	1.96	0.48
2:D:245:LEU:CD1	2:D:267:VAL:HG21	2.44	0.48
4:H:61:SER:O	4:H:61:SER:OG	2.17	0.48
4:H:287:ASP:OD1	4:H:287:ASP:N	2.47	0.48
2:D:14:ARG:O	2:D:14:ARG:NH1	2.47	0.48
5:J:302:VAL:HG12	5:J:303:HIS:N	2.29	0.47
3:F:244:PRO:O	3:F:245:ASN:ND2	2.48	0.47
4:H:25:ALA:O	4:H:29:THR:HG23	2.15	0.47
4:H:45:LEU:HD13	4:H:45:LEU:C	2.34	0.47
2:C:11:LEU:HD11	2:C:45:ILE:HG22	1.96	0.47
3:E:388:ILE:N	3:E:389:PRO:CD	2.78	0.47
2:D:302:ILE:HG22	3:E:377:VAL:HG11	1.96	0.47
5:I:114:LEU:O	5:I:118:VAL:HG23	2.15	0.47
1:B:53:ASP:OD2	1:B:53:ASP:C	2.53	0.46
4:H:204:GLY:HA2	4:H:296:VAL:HG11	1.96	0.46
3:F:188:ARG:NH2	3:F:216:GLN:O	2.45	0.46
3:F:388:ILE:N	3:F:389:PRO:CD	2.78	0.46
4:H:178:VAL:HG11	4:H:186:ILE:CD1	2.45	0.46
1:A:53:ASP:OD2	1:A:53:ASP:C	2.54	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:332:THR:O	1:B:332:THR:OG1	2.33	0.46
1:A:60:SER:O	1:A:60:SER:OG	2.33	0.46
1:B:148:PHE:O	1:B:252:CYS:N	2.46	0.46
4:G:153:THR:HG23	4:G:180:ASP:HA	1.98	0.46
1:B:367:VAL:HB	1:B:384:HIS:ND1	2.32	0.45
5:J:35:LEU:HD11	5:J:107:ASP:HA	1.97	0.45
2:C:78:VAL:O	2:C:82:VAL:HG23	2.16	0.45
4:G:45:LEU:HD13	4:G:45:LEU:C	2.36	0.45
4:H:213:ASN:O	4:H:217:VAL:HG23	2.16	0.45
1:A:65:ARG:NH2	1:A:301:SER:O	2.50	0.45
3:F:347:GLN:NE2	3:F:375:SER:OG	2.49	0.45
4:G:56:LEU:HD23	4:G:56:LEU:HA	1.66	0.45
5:J:321:GLU:O	5:J:325:GLN:NE2	2.49	0.45
2:D:240:LEU:HD12	2:D:244:ALA:HB3	1.97	0.45
4:G:13:GLN:C	4:G:15:LYS:H	2.19	0.45
4:G:46:ARG:HH11	4:G:46:ARG:CG	2.21	0.45
3:F:232:ALA:O	3:F:236:VAL:HG23	2.17	0.45
5:J:28:LEU:HD13	5:J:319:TYR:HE1	1.82	0.45
1:B:366:THR:HA	1:B:383:CYS:O	2.17	0.45
1:A:332:THR:O	1:A:332:THR:OG1	2.33	0.44
3:E:305:ASP:OD1	3:E:305:ASP:N	2.48	0.44
5:J:114:LEU:O	5:J:118:VAL:HG23	2.17	0.44
1:A:73:VAL:HG12	1:A:78:TYR:CE1	2.52	0.44
1:B:104:GLU:OE2	1:B:104:GLU:C	2.55	0.44
1:B:65:ARG:NH2	1:B:301:SER:O	2.50	0.44
1:A:104:GLU:OE2	1:A:104:GLU:C	2.55	0.44
5:J:161:ASP:OD1	5:J:162:SER:N	2.51	0.44
1:A:367:VAL:HB	1:A:384:HIS:ND1	2.32	0.44
4:G:13:GLN:C	4:G:15:LYS:N	2.70	0.44
1:A:366:THR:HA	1:A:383:CYS:O	2.17	0.44
2:C:56:GLU:OE2	2:C:57:LEU:N	2.51	0.44
2:C:8:GLY:N	2:C:10:GLU:OE2	2.50	0.44
4:G:14:MET:HE1	4:G:28:ARG:NE	2.29	0.44
1:B:258:GLN:O	1:B:261:THR:OG1	2.33	0.43
3:F:373:LEU:O	3:F:377:VAL:HG23	2.18	0.43
1:B:73:VAL:HG12	1:B:78:TYR:CE1	2.52	0.43
3:E:362:ASP:OD2	3:E:363:SER:N	2.48	0.43
2:D:245:LEU:HD11	2:D:267:VAL:HG21	1.98	0.43
1:B:271:ASP:OD1	1:B:272:PHE:N	2.51	0.43
4:H:43:GLN:N	4:H:43:GLN:NE2	2.59	0.43
5:I:169:PHE:CE2	5:I:171:ALA:HB2	2.45	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:J:221:ILE:HG23	5:J:227:GLU:HB2	2.00	0.43
1:A:71:ALA:O	1:A:72:ASN:HB2	2.19	0.43
1:A:271:ASP:OD1	1:A:272:PHE:N	2.51	0.43
5:I:158:ILE:CG2	5:I:160:VAL:HG23	2.49	0.43
1:B:71:ALA:O	1:B:72:ASN:HB2	2.19	0.43
4:G:210:ILE:HD12	4:G:274:ASP:HB3	2.00	0.43
4:G:153:THR:HG22	4:G:155:SER:H	1.84	0.43
5:J:88:ASP:OD1	5:J:91:ARG:NH1	2.52	0.43
2:C:281:GLU:HB3	4:G:120:LYS:HD2	2.01	0.42
3:E:275:ASN:ND2	3:E:441:TYR:O	2.48	0.42
1:A:426:LYS:O	1:A:429:SER:HB3	2.19	0.42
3:E:232:ALA:O	3:E:236:VAL:HG23	2.19	0.42
4:H:231:GLU:N	4:H:231:GLU:OE1	2.52	0.42
1:A:385:ILE:HG22	1:A:389:VAL:HG21	2.02	0.42
4:G:231:GLU:OE1	4:G:231:GLU:N	2.50	0.42
4:H:56:LEU:HD23	4:H:56:LEU:HA	1.62	0.42
1:B:231:PHE:HB3	5:J:197:THR:HG21	2.01	0.42
2:D:21:THR:O	2:D:26:GLY:N	2.53	0.42
5:J:44:GLU:N	5:J:44:GLU:OE2	2.53	0.42
1:A:148:PHE:O	1:A:252:CYS:N	2.46	0.42
3:F:202:VAL:HG13	3:F:203:ILE:HG12	2.02	0.42
5:I:130:MET:SD	5:I:302:VAL:HG22	2.60	0.42
1:B:385:ILE:HG22	1:B:389:VAL:HG21	2.02	0.42
2:C:62:ARG:NH1	2:C:351:LEU:O	2.46	0.42
4:H:111:ILE:HG21	4:H:229:VAL:HG13	2.02	0.42
2:C:144:LEU:O	2:C:147:THR:HG22	2.18	0.42
4:H:48:ASN:C	4:H:48:ASN:ND2	2.72	0.42
4:G:112:ALA:HA	4:G:137:VAL:HG22	2.02	0.41
1:B:426:LYS:O	1:B:429:SER:HB3	2.19	0.41
5:I:7:VAL:HG13	5:I:7:VAL:O	2.19	0.41
1:B:349:SER:OG	1:B:367:VAL:HA	2.20	0.41
4:H:131:SER:OG	4:H:134:VAL:HG12	2.20	0.41
3:E:455:ASN:ND2	3:E:489:TYR:O	2.45	0.41
3:F:230:LEU:HD11	3:F:276:ALA:HB1	2.03	0.41
1:A:115:THR:O	1:A:115:THR:OG1	2.39	0.41
1:A:349:SER:OG	1:A:367:VAL:HA	2.20	0.41
4:G:45:LEU:HD22	4:G:45:LEU:HA	1.61	0.41
1:B:57:PHE:CE2	1:B:61:LYS:HE2	2.56	0.41
2:D:326:SER:OG	2:D:327:ASN:N	2.53	0.41
4:G:229:VAL:HG12	4:G:285:PHE:HB2	2.03	0.41
4:H:152:VAL:O	4:H:178:VAL:HG22	2.21	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:11:LEU:HD11	2:C:45:ILE:CG2	2.51	0.41
1:A:56:PHE:O	1:A:59:ILE:N	2.49	0.40
2:D:228:ARG:NH2	3:E:450:ASP:OD1	2.54	0.40
4:G:158:ASP:O	4:G:160:SER:N	2.53	0.40
5:J:30:VAL:HG13	5:J:323:ASN:OD1	2.21	0.40
1:A:196:CYS:HB3	1:A:199:ASP:OD1	2.22	0.40
1:B:56:PHE:O	1:B:59:ILE:N	2.49	0.40
1:B:345:GLY:O	1:B:348:VAL:HG23	2.21	0.40
2:C:42:LEU:HD13	2:C:85:VAL:HG21	2.03	0.40
2:C:274:LEU:HD21	2:C:336:ILE:HG21	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	410/721 (57%)	390 (95%)	19 (5%)	1 (0%)	47	78
1	B	410/721 (57%)	390 (95%)	19 (5%)	1 (0%)	47	78
2	C	314/368 (85%)	303 (96%)	11 (4%)	0	100	100
2	D	314/368 (85%)	302 (96%)	12 (4%)	0	100	100
3	E	349/523 (67%)	345 (99%)	4 (1%)	0	100	100
3	F	344/523 (66%)	342 (99%)	2 (1%)	0	100	100
4	G	257/322 (80%)	250 (97%)	7 (3%)	0	100	100
4	H	258/322 (80%)	252 (98%)	6 (2%)	0	100	100
5	I	205/452 (45%)	189 (92%)	16 (8%)	0	100	100
5	J	219/452 (48%)	201 (92%)	18 (8%)	0	100	100
All	All	3080/4772 (64%)	2964 (96%)	114 (4%)	2 (0%)	54	81

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	58	PRO
1	B	58	PRO

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	351/626 (56%)	328 (93%)	23 (7%)	16	44
1	B	351/626 (56%)	328 (93%)	23 (7%)	16	44
2	C	268/312 (86%)	266 (99%)	2 (1%)	84	95
2	D	266/312 (85%)	259 (97%)	7 (3%)	46	79
3	E	307/444 (69%)	304 (99%)	3 (1%)	76	93
3	F	302/444 (68%)	301 (100%)	1 (0%)	92	98
4	G	206/274 (75%)	193 (94%)	13 (6%)	18	46
4	H	201/274 (73%)	193 (96%)	8 (4%)	31	65
5	I	182/398 (46%)	178 (98%)	4 (2%)	52	83
5	J	196/398 (49%)	190 (97%)	6 (3%)	40	74
All	All	2630/4108 (64%)	2540 (97%)	90 (3%)	40	71

All (90) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	53	ASP
1	A	60	SER
1	A	73	VAL
1	A	104	GLU
1	A	109	SER
1	A	115	THR
1	A	145	ARG
1	A	151	VAL
1	A	166	GLU
1	A	199	ASP

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Mol	Chain	Res	Type
1	A	207	SER
1	A	221	LEU
1	A	250	SER
1	A	292	THR
1	A	309	VAL
1	A	321	LEU
1	A	332	THR
1	A	335	CYS
1	A	359	ASN
1	A	370	SER
1	A	429	SER
1	A	433	SER
1	A	450	SER
1	B	53	ASP
1	B	60	SER
1	B	73	VAL
1	B	104	GLU
1	B	109	SER
1	B	115	THR
1	B	145	ARG
1	B	151	VAL
1	B	166	GLU
1	B	199	ASP
1	B	207	SER
1	B	221	LEU
1	B	250	SER
1	B	292	THR
1	B	309	VAL
1	B	321	LEU
1	B	332	THR
1	B	335	CYS
1	B	359	ASN
1	B	370	SER
1	B	429	SER
1	B	433	SER
1	B	450	SER
2	C	9	SER
2	C	56	GLU
2	D	9	SER
2	D	30	SER
2	D	49	HIS
2	D	84	ARG

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Mol	Chain	Res	Type
2	D	125	HIS
2	D	213	GLU
2	D	252	HIS
3	E	469	GLU
3	E	470	HIS
3	E	492	THR
3	F	331	ASP
4	G	9	TYR
4	G	10	PHE
4	G	14	MET
4	G	17	ASP
4	G	19	ASP
4	G	43	GLN
4	G	45	LEU
4	G	46	ARG
4	G	51	SER
4	G	75	PHE
4	G	88	LYS
4	G	239	PHE
4	G	273	VAL
4	H	43	GLN
4	H	45	LEU
4	H	48	ASN
4	H	49	LEU
4	H	54	GLU
4	H	55	THR
4	H	120	LYS
4	H	192	LEU
5	I	8	MET
5	I	169	PHE
5	I	185	SER
5	I	220	SER
5	J	32	ASN
5	J	158	ILE
5	J	161	ASP
5	J	196	HIS
5	J	199	LEU
5	J	214	PHE

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (24) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	288	HIS
1	A	376	ASN
1	B	376	ASN
2	C	160	HIS
2	C	252	HIS
2	C	331	ASN
3	E	213	GLN
3	E	448	GLN
3	F	213	GLN
3	F	223	ASN
3	F	245	ASN
3	F	254	ASN
3	F	347	GLN
3	F	448	GLN
3	F	464	GLN
4	G	156	GLN
4	G	222	GLN
4	G	243	GLN
4	H	48	ASN
4	H	156	GLN
4	H	222	GLN
4	H	243	GLN
5	I	218	ASN
5	J	218	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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

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-23209. 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 ⓘ

6.1.1 Primary map

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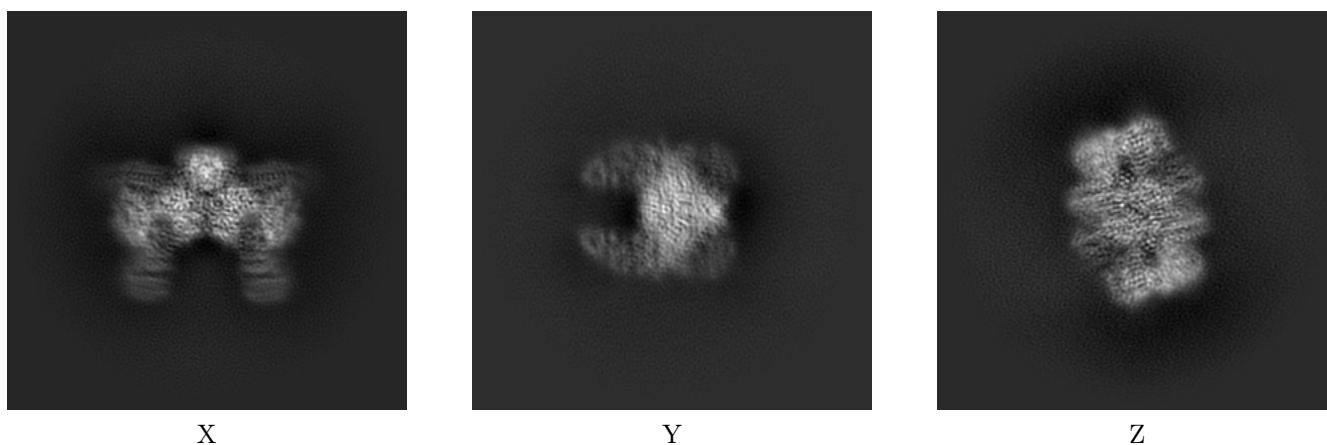
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ

6.2.1 Primary map

| X Index: 200 | Y Index: 200 | Z Index: 200 |
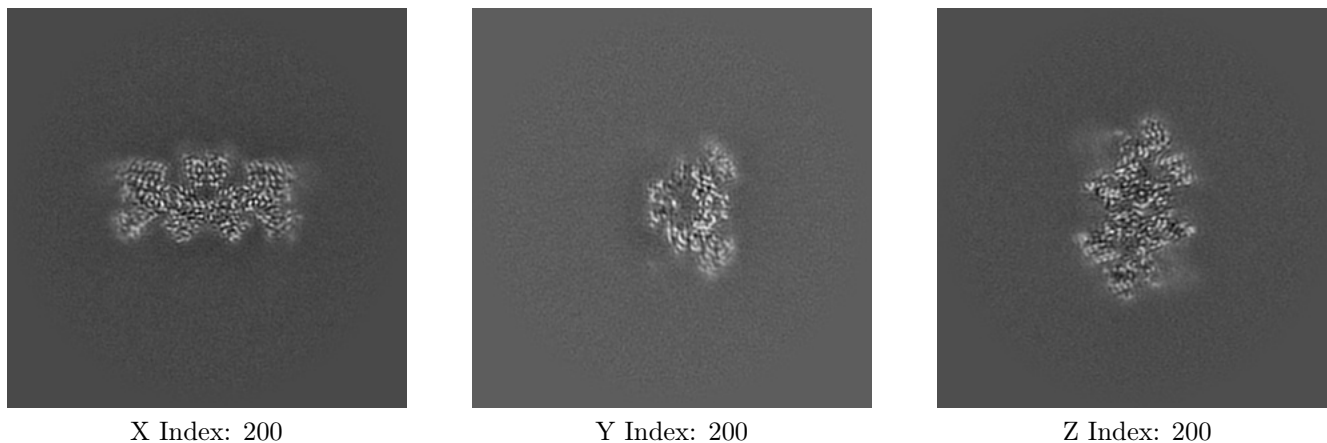
The images above show central slices of the map in three orthogonal directions.

6.3   Largest variance slices ⓘ
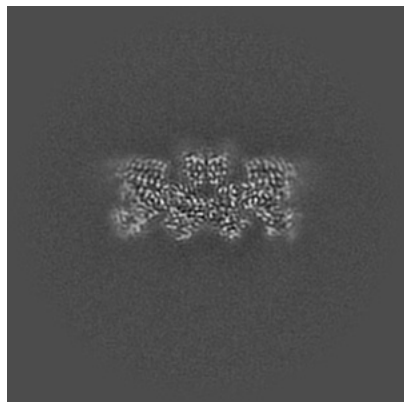
6.3.1   Primary map
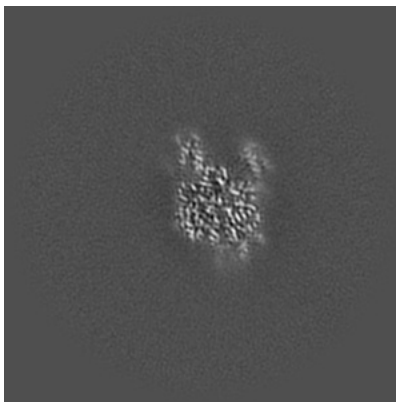
X Index: 199   Y Index: 186   Z Index: 203
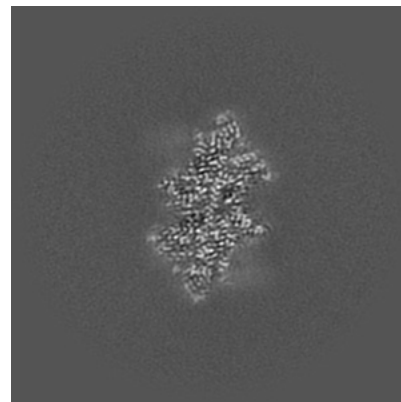
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1   Primary map

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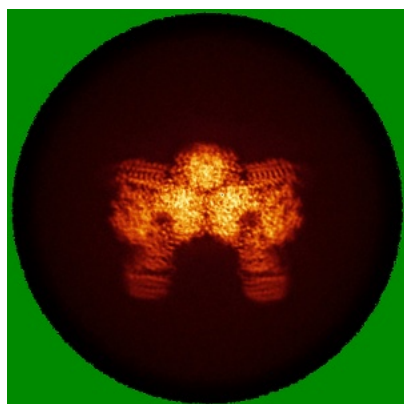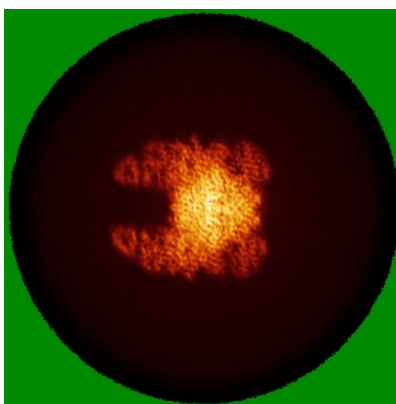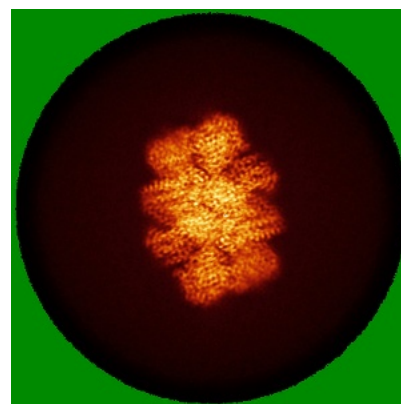
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

X   Y   Z
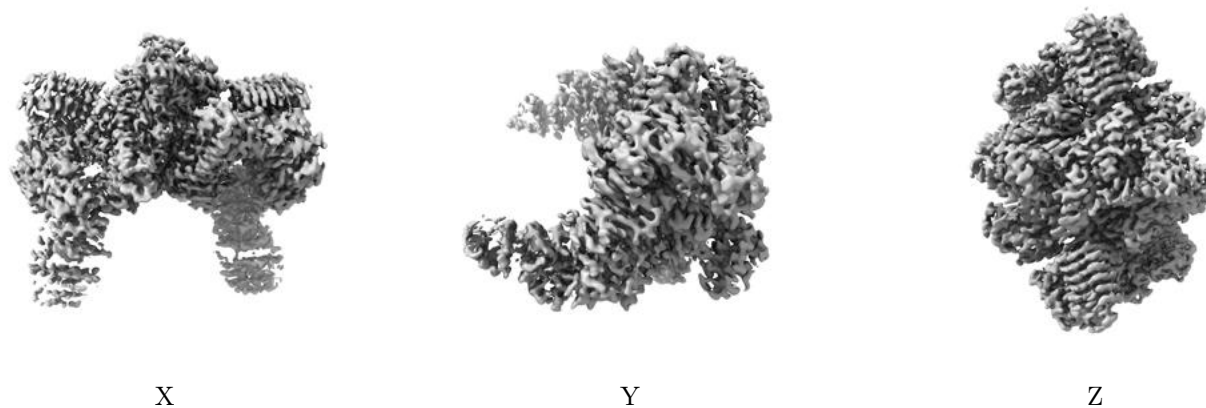
The images above show the 3D surface view of the map at the recommended contour level 0.5. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

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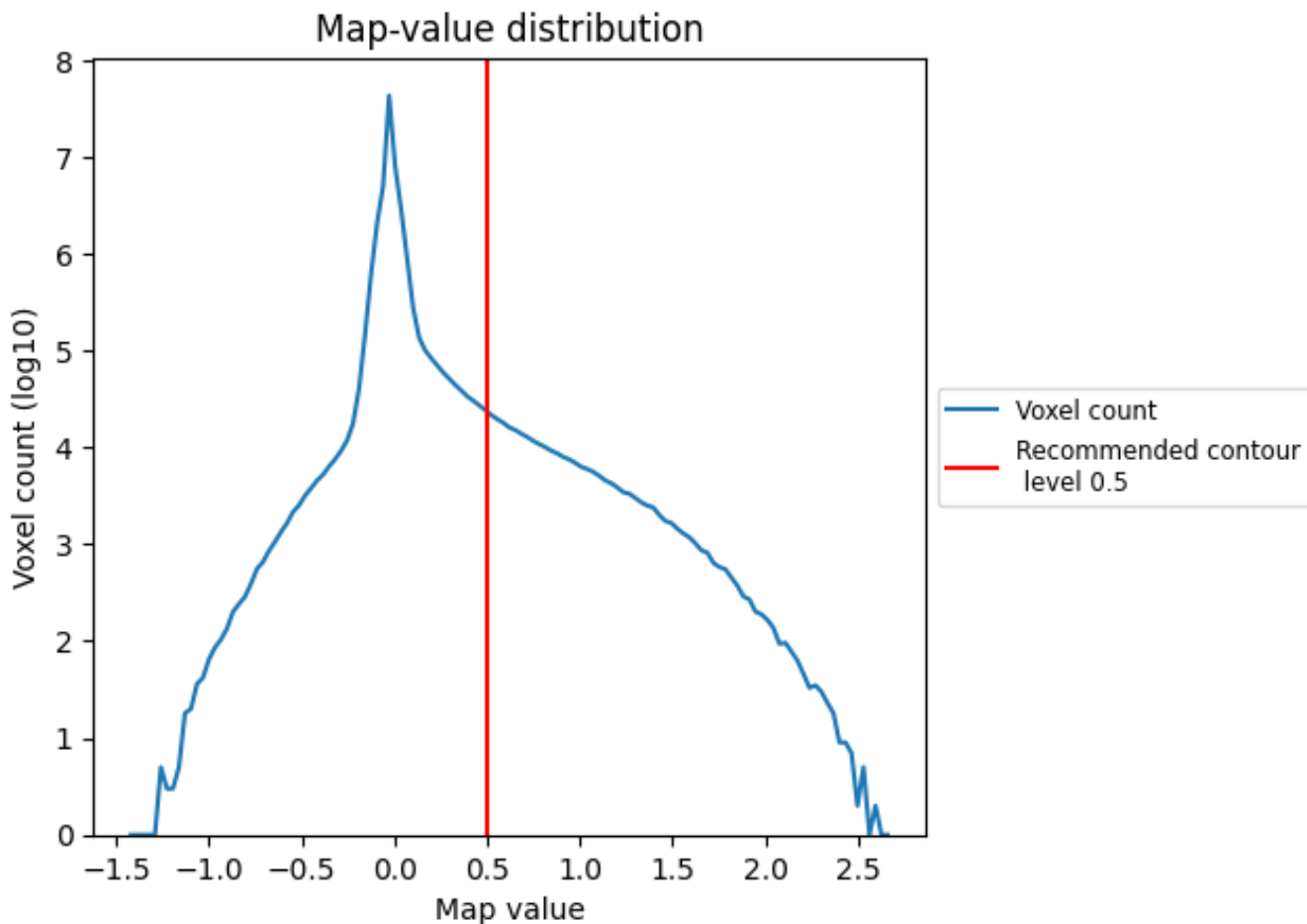
The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

7.2   Volume estimate ⓘ
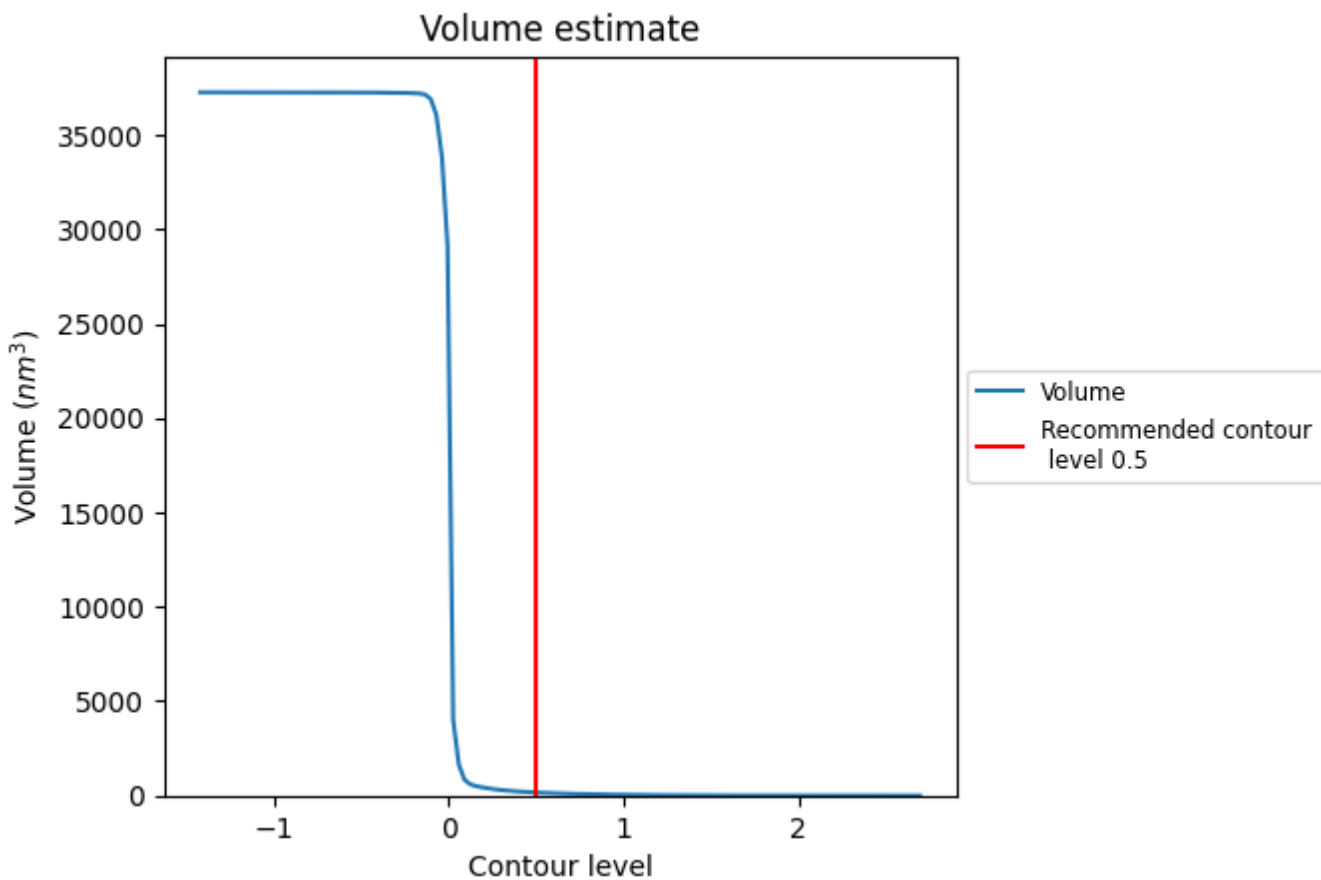
The volume at the recommended contour level is 161 nm^3; this corresponds to an approximate mass of 145 kDa.

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 ⓘ
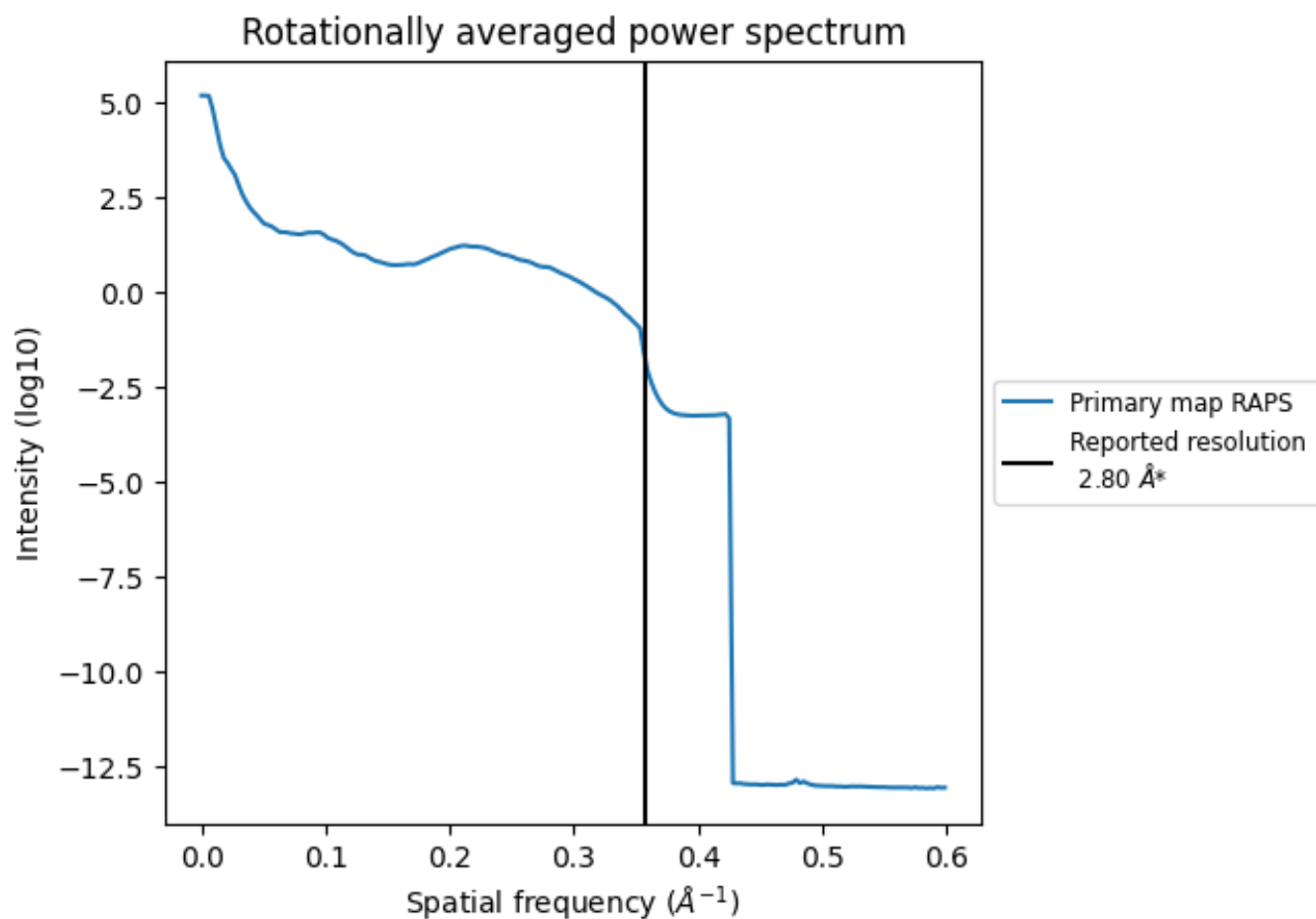
*Reported resolution corresponds to spatial frequency of 0.357 Å^{-1}

8 Fourier-Shell correlation ⓘ

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

9　Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-23209 and PDB model 7L70. Per-residue inclusion information can be found in section 3 on page 8.

9.1　Map-model overlay ⓘ

X	Y	Z
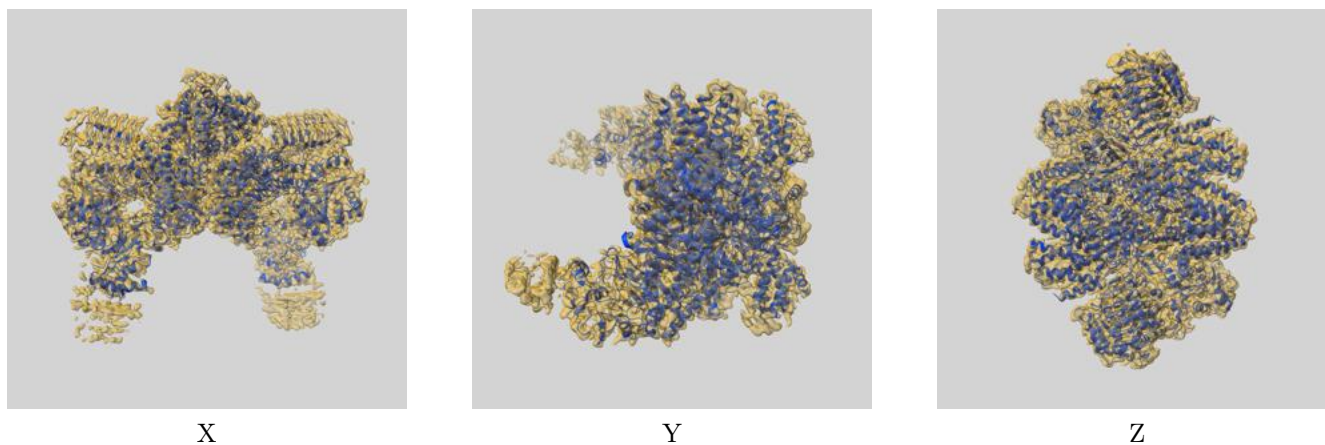
The images above show the 3D surface view of the map at the recommended contour level 0.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2　Q-score mapped to coordinate model ⓘ

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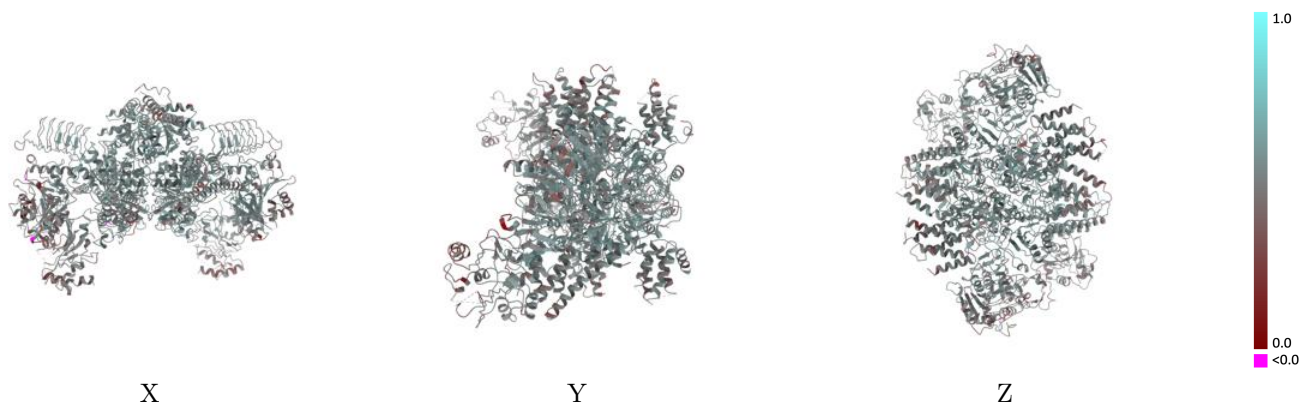
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

9.3　Atom inclusion mapped to coordinate model ⓘ

X	Y	Z
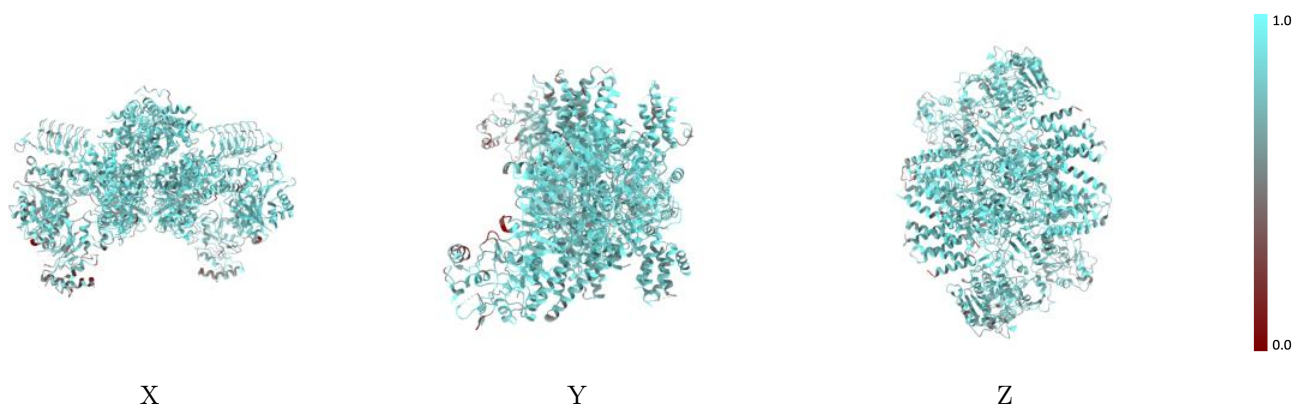
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.5).

9.4   Atom inclusion ⓘ
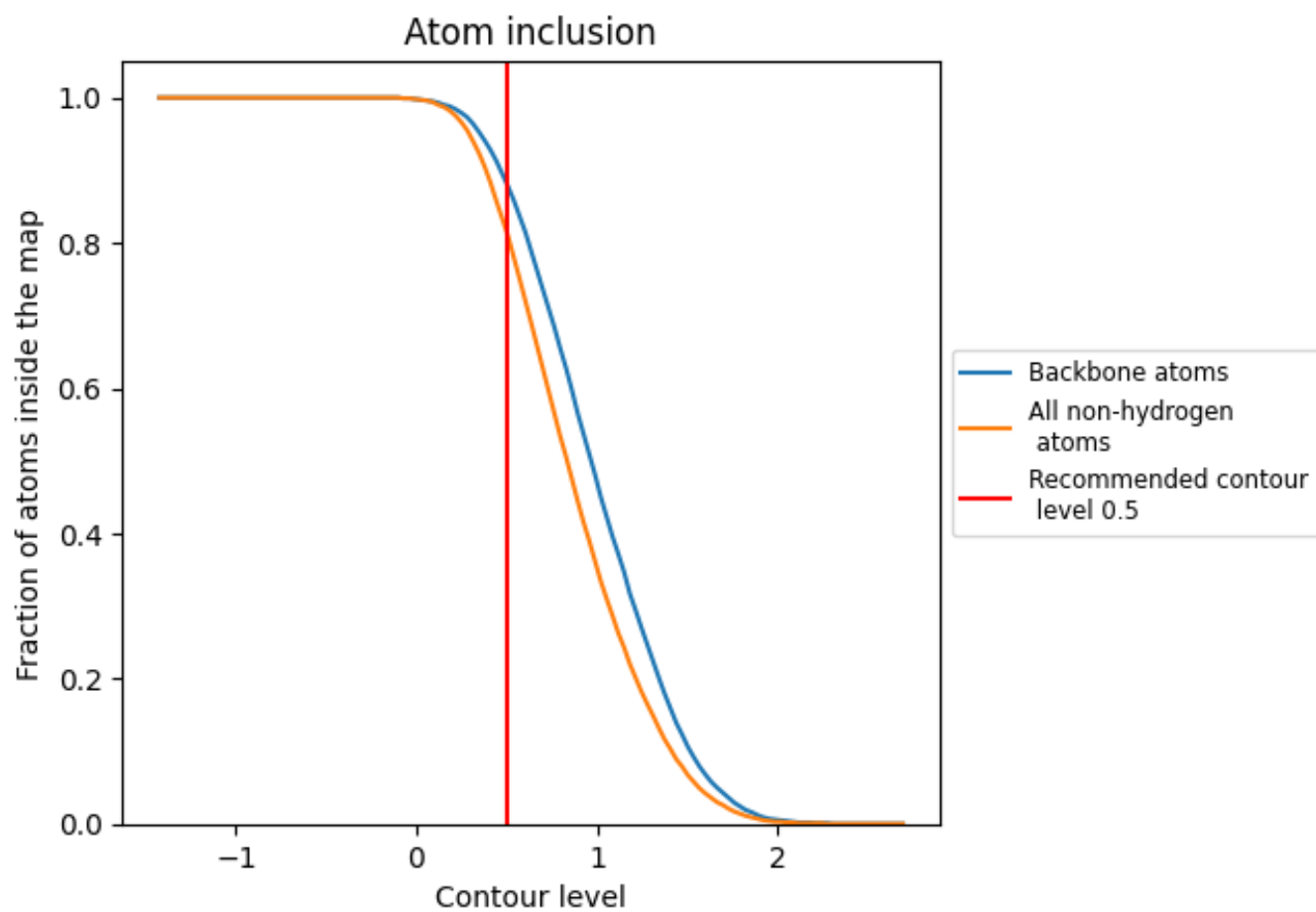
At the recommended contour level, 88% of all backbone atoms, 82% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.5) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.8150	0.5090
A	0.7520	0.4730
B	0.8170	0.5080
C	0.8440	0.5210
D	0.8470	0.5130
E	0.8560	0.5360
F	0.8480	0.5300
G	0.8460	0.5330
H	0.8490	0.5280
I	0.6990	0.4630
J	0.7640	0.4820

1.0

0.0
<0.0