Full wwPDB EM Validation Report (i)

Jun 10, 2025 – 03:00 PM JST

PDB ID	:	8YFE / pdb_00008yfe
EMDB ID	:	EMD-39221
Title	:	Cryo EM structure of Komagataella phaffii Rat1-Rai1 complex
Authors	:	Yanagisawa, T.; Murayama, Y.; Ehara, H.; Sekine, S.I.
Deposited on	:	2024-02-24
Resolution	:	3.47 Å(reported)

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

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/EMValidationReportHelp
with specific help available everywhere you see the (i) symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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

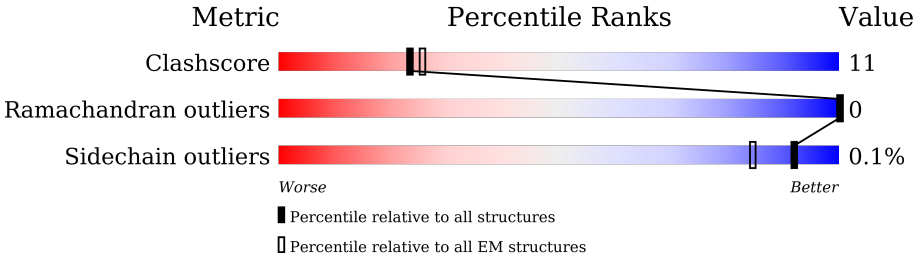
EMDB validation analysis	:	0.0.1.dev118
MolProbity	:	4-5-2 with Phenix2.0rc1
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.43.1

1 Overall quality at a glance (i)

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

The reported resolution of this entry is 3.47 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)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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	1006	51% 18% 32%
1	C	1006	50% 17% 33%
2	B	384	66% 30% .
2	D	384	73% 26% .

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 17315 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 5'-3' exoribonuclease.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	687	5651	3631	962	1038	20	0	0
1	C	672	5519	3545	938	1016	20	0	0

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	233	ALA	ASP	engineered mutation	UNP F2QV79
A	235	ALA	ASP	engineered mutation	UNP F2QV79
A	995	SER	-	expression tag	UNP F2QV79
A	996	GLY	-	expression tag	UNP F2QV79
A	997	PRO	-	expression tag	UNP F2QV79
A	998	SER	-	expression tag	UNP F2QV79
A	999	SER	-	expression tag	UNP F2QV79
A	1000	GLY	-	expression tag	UNP F2QV79
A	1001	LEU	-	expression tag	UNP F2QV79
A	1002	GLU	-	expression tag	UNP F2QV79
A	1003	VAL	-	expression tag	UNP F2QV79
A	1004	LEU	-	expression tag	UNP F2QV79
A	1005	PHE	-	expression tag	UNP F2QV79
A	1006	GLN	-	expression tag	UNP F2QV79
C	233	ALA	ASP	engineered mutation	UNP F2QV79
C	235	ALA	ASP	engineered mutation	UNP F2QV79
C	995	SER	-	expression tag	UNP F2QV79
C	996	GLY	-	expression tag	UNP F2QV79
C	997	PRO	-	expression tag	UNP F2QV79
C	998	SER	-	expression tag	UNP F2QV79
C	999	SER	-	expression tag	UNP F2QV79
C	1000	GLY	-	expression tag	UNP F2QV79
C	1001	LEU	-	expression tag	UNP F2QV79
C	1002	GLU	-	expression tag	UNP F2QV79
C	1003	VAL	-	expression tag	UNP F2QV79
C	1004	LEU	-	expression tag	UNP F2QV79

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Chain	Residue	Modelled	Actual	Comment	Reference
C	1005	PHE	-	expression tag	UNP F2QV79
C	1006	GLN	-	expression tag	UNP F2QV79

- Molecule 2 is a protein called Decapping nuclease.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	371	3051	1954	516	569	12	0	0
			Total	C	N	O	S		
2	D	377	3094	1979	523	580	12	0	0

There are 10 discrepancies between the modelled and reference sequences:

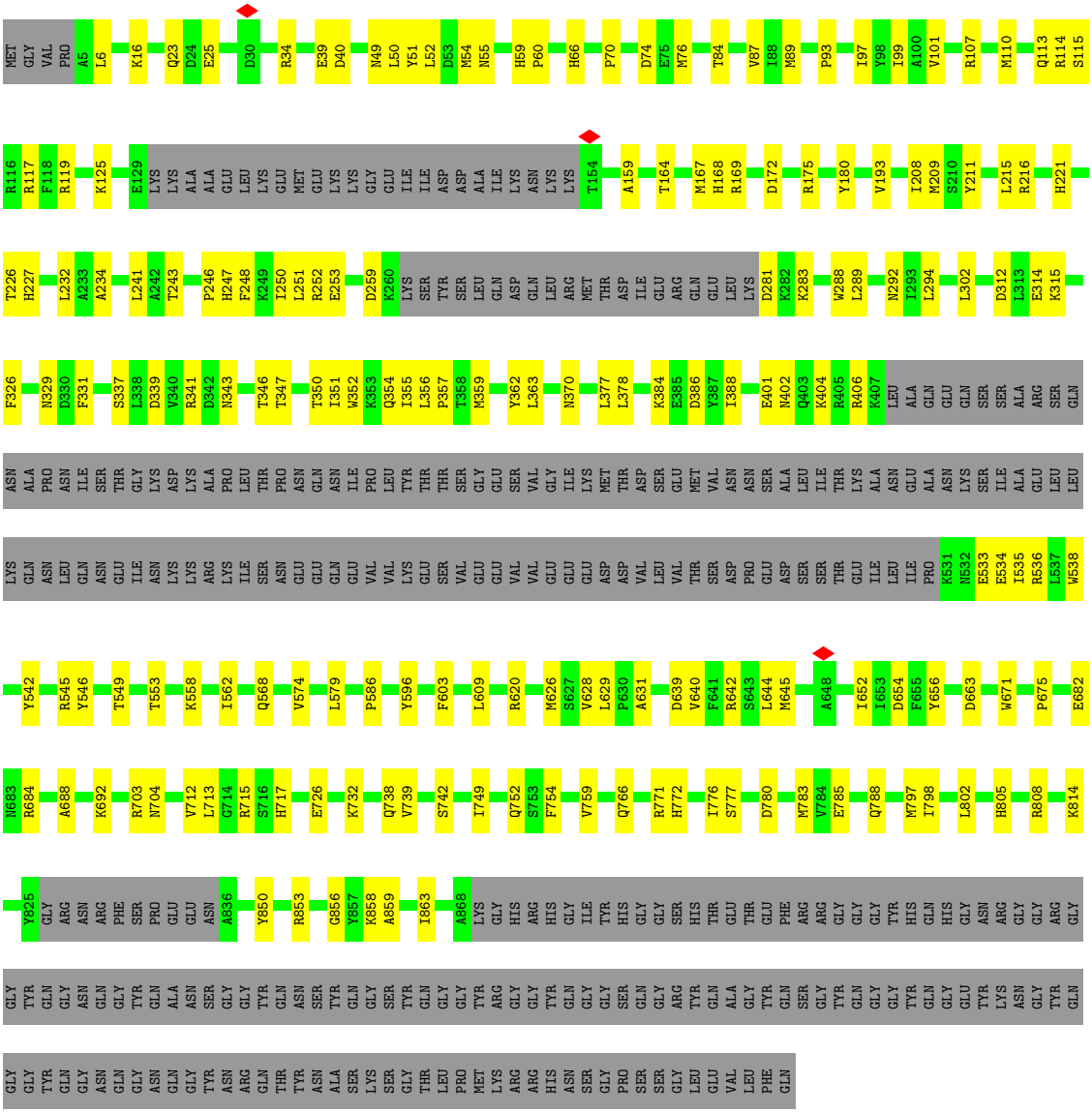
Chain	Residue	Modelled	Actual	Comment	Reference
B	-2	GLY	-	expression tag	UNP F2QLF5
B	-1	PRO	-	expression tag	UNP F2QLF5
B	0	GLY	-	expression tag	UNP F2QLF5
B	213	ALA	GLU	engineered mutation	UNP F2QLF5
B	215	ALA	ASP	engineered mutation	UNP F2QLF5
D	-2	GLY	-	expression tag	UNP F2QLF5
D	-1	PRO	-	expression tag	UNP F2QLF5
D	0	GLY	-	expression tag	UNP F2QLF5
D	213	ALA	GLU	engineered mutation	UNP F2QLF5
D	215	ALA	ASP	engineered mutation	UNP F2QLF5

3 Residue-property plots (i)

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: 5'-3' exoribonuclease

Chain A: 51% 18% 32%



- Molecule 1: 5'-3' exoribonuclease

Chain C: 50% 17% 33%

MET GLY VAL PRO A5 L6 F7 R8 R12 D28 I29 R34 P35 T36 R37 D40 P41 N42 Y51 M54 N55 V58 H63 PRO GLU HIS LYS PRO V69 P70 E71 T72 E73 M77 A91 I97 V101 R107 M110 N111 R114 R117 F118 R119

Q122 E129 LYS LYS ALA ALA GLU LEU LYS GLU MET GLU LYS LYS GLY GLU ILE ILE ASP ASP ALA ILE LYS ASN LYS LYS THR TRP D156 T161 P162 G163 T164 P165 R169 S173 Y176 W188 I191 E192 V193 A198 E203 G204 E205 H206 K207 I208 H221

H227 C228 I229 H244 E245 P246 L251 R252 E253 A257 GLN ASP LYS LYS SER TYR SER LEU GLN ASP GLN LEU ARG MET THR ASP ILE GLU ARG GLN GLU LEU LYS ASP LYS K283 F286 L287 W288 N292 I293 L294 R295 L302 N303 V304 L307 S308 F309 E314 K315

W320 N329 D330 F331 L332 P333 H334 L338 D339 V340 I345 W352 I355 T358 M359 Y362 L363 T364 T365 N370 R376 L377 L378 E385 D386 K391 R392 Y393 K397 R398 S399 L400 E401 N402 Q403 K404 R405 R406 LYS LEU ALA GLN GLU GLN SER SER ALA

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

GLU LEU LEU LYS GLN ASN LEU GLN ASN GLU ILE ASN LYS LYS ARG LYS ILE SER ASN GLU GLN GLN GLU VAL VAL LYS GLU SER VAL GLU GLU VAL VAL GLU GLU GLU GLU ASP ASP VAL LEU VAL THR SER ASP PRO GLU ASP SER SER THR GLU ILE LEU ILE PRO LYS ASN E533 E534 I535

R536 E539 Y542 R543 Y546 Y547 E548 T549 K550 K554 K558 K561 M566 V567 Q583 W590 Y594 P598 D602 F603 E608 Y622 M626 L629 P630 L637 P638 D639 V640 F641 R642 S643 A648 N649 D654 F655 Y656 E659 N665

G666 K667 K668 V669 I670 A673 I674 P675 I680 L686 K692 L696 E700 R703 R715 S716 H717 S718 H719 Y720 L723 E726 K732 D733 E736 V739 V747 L751 F754 D755 R756 V759 L760 R761 L762 R771 H772 S777 N778 R779

H793 I798 L802 H805 R808 F824 TYR GLY ARG ASN ARG PHE SER PRO GLU E834 D837 Q840 Y841 Y850 Q854 A859 I863 H864 E867 ALA LYS GLY HIS ARG HIS GLY ILE TYR HIS GLY GLY SER HIS THR GLU THR GLU PHE ARG ARG GLY GLY

GLY TYR HIS GLN HIS GLY ASN ARG GLY GLY ARG GLY GLY TYR GLN GLY ASN GLN GLY TYR GLN ALA ASN SER GLY GLY TYR GLN ASN SER TYR GLN GLY SER TYR GLN GLY GLY TYR GLN GLY GLY TYR GLN GLY GLY SER GLN GLY ARG TYR GLN ALA GLY TYR GLN SER GLY TYR GLN

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

- Molecule 2: Decapping nuclease

Chain B: 66% 30% •

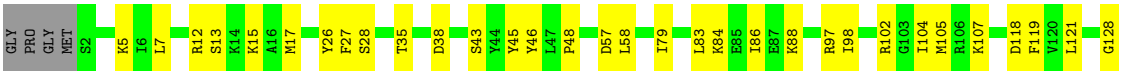
GLY PRO GLY MET S2 K3 E4 K5 L18 P21 Y26 R29 T35 S43 Y44 Y45 Y46 L47 P48 I52 D53 D57 L58 S59 H64 V71 P78 A82 I86 E87 S90 R97 T100 W101 R102 G103 I104 M105 R106 L109 T110 L111

D114 D118 L121 D122 V123 L130 N135 V136 P137 Y138 L139 K142 D143 V144 Q145 K146 Q147 GLY ASP T150 K162 M166 A167 T168 W173 T177 R178 K179 E180 I181 R184 K188 A197 I198 S204 R205 L209 G212 T238 I239 Y242 M245

F248 K251 R254 A257 Q258 C259 F260 L261 L262 G263 I264 I267 F271 R272 D273 D274 N275 C276 I277 L278 R279 T280 V281 F284 S285 T286 N287 D288 M292 N296 P297 L298 Q301 PRO LYS K304 V319 E320 W321 L322 N323 V326 Q330 V331 W332 K333 L334

- Molecule 2: Decapping nuclease

Chain D:



4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C2	Depositor
Number of particles used	526250	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	61.9	Depositor
Minimum defocus (nm)	1600	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.107	Depositor
Minimum map value	-0.043	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.013	Depositor
Map size (Å)	298.8, 298.8, 298.8	wwPDB
Map dimensions	200, 200, 200	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.494, 1.494, 1.494	Depositor

5 Model quality (i)

5.1 Standard geometry (i)

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	0.10	0/5806	0.29	0/7864
1	C	0.10	0/5667	0.26	0/7675
2	B	0.11	0/3114	0.32	0/4197
2	D	0.11	0/3160	0.28	0/4262
All	All	0.10	0/17747	0.29	0/23998

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts (i)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	5651	0	5544	117	0
1	C	5519	0	5410	117	0
2	B	3051	0	3069	81	0
2	D	3094	0	3109	63	0
All	All	17315	0	17132	371	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 11.

All (371) 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:100:THR:HG21	2:B:105:MET:HE3	1.64	0.77
1:C:669:VAL:HG13	1:C:670:ILE:HG12	1.65	0.77
1:A:771:ARG:HG2	1:A:772:HIS:H	1.54	0.72
2:B:296:ASN:ND2	2:B:298:LEU:O	2.23	0.72
2:D:303:LYS:NZ	2:D:307:CYS:SG	2.63	0.71
1:C:363:LEU:HD21	1:C:377:LEU:HD22	1.72	0.71
2:B:259:CYS:O	2:B:263:GLY:N	2.23	0.71
1:C:756:ARG:HB3	1:C:779:ARG:HH12	1.55	0.69
1:C:51:TYR:HB3	1:C:208:ILE:HD12	1.75	0.69
1:C:808:ARG:N	1:C:841:TYR:OH	2.26	0.69
2:D:83:LEU:HD13	2:D:86:ILE:HD11	1.75	0.69
2:B:330:GLN:NE2	2:B:348:GLU:OE1	2.25	0.68
1:A:51:TYR:HB3	1:A:208:ILE:HD12	1.75	0.68
1:A:93:PRO:HG3	1:A:97:ILE:HD11	1.76	0.67
1:C:547:TYR:OH	1:C:602:ASP:OD2	2.13	0.67
2:B:332:TRP:HA	2:B:348:GLU:HA	1.77	0.67
2:B:102:ARG:HD2	2:B:212:GLY:HA2	1.77	0.66
1:C:640:VAL:HG12	1:C:692:LYS:HD3	1.76	0.66
1:C:837:ASP:OD2	1:C:840:GLN:NE2	2.28	0.66
2:B:198:ILE:HD11	2:B:209:LEU:HB3	1.78	0.66
2:D:104:ILE:HG12	2:D:121:LEU:HD11	1.76	0.65
1:A:216:ARG:NH2	1:A:243:THR:O	2.29	0.65
1:C:566:MET:HB3	1:C:598:PRO:HG3	1.77	0.65
1:A:55:ASN:O	1:A:59:HIS:CE1	2.50	0.65
1:C:304:VAL:HG23	1:C:307:LEU:HD21	1.79	0.65
2:D:259:CYS:O	2:D:263:GLY:N	2.30	0.64
1:C:736:GLU:HG3	1:C:747:VAL:HG22	1.80	0.64
1:C:583:GLN:HE22	1:C:793:HIS:HA	1.63	0.63
1:C:717:HIS:HE1	1:C:719:HIS:HD2	1.47	0.63
1:A:853:ARG:NH1	2:B:53:ASP:OD1	2.28	0.62
1:C:637:LEU:HD12	1:C:638:PRO:HD2	1.80	0.62
1:A:23:GLN:HG2	1:A:283:LYS:HD2	1.80	0.62
1:C:643:SER:OG	1:C:692:LYS:NZ	2.29	0.62
1:C:107:ARG:NH1	1:C:111:ASN:OD1	2.31	0.62
1:C:622:TYR:OH	1:C:700:GLU:OE1	2.17	0.62
1:A:401:GLU:HA	1:A:404:LYS:HE2	1.81	0.62
2:D:12:ARG:HD2	2:D:313:ASN:HB2	1.82	0.62
2:D:118:ASP:O	2:D:138:TYR:OH	2.18	0.62
2:D:363:ILE:O	2:D:368:LYS:NZ	2.33	0.62
2:B:144:VAL:O	2:B:147:GLN:NE2	2.30	0.61
1:C:119:ARG:NH2	1:C:673:ALA:O	2.33	0.61
2:D:15:LYS:HG2	2:D:17:MET:HE1	1.82	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:190:ASN:ND2	2:D:193:GLU:OE1	2.33	0.61
1:A:97:ILE:HB	1:A:193:VAL:HG12	1.80	0.61
2:B:106:ARG:HH21	2:B:254:ARG:HB2	1.66	0.61
2:B:251:LYS:HA	2:B:254:ARG:HE	1.64	0.61
1:C:399:SER:HA	1:C:402:ASN:HD22	1.66	0.61
1:C:756:ARG:NH1	1:C:778:ASN:O	2.34	0.61
2:B:110:THR:HB	2:B:114:ASP:HB3	1.83	0.60
1:C:122:GLN:NE2	1:C:659:GLU:OE1	2.34	0.60
1:A:74:ASP:OD1	1:A:169:ARG:NH2	2.34	0.60
1:A:535:ILE:HD13	1:A:546:TYR:HA	1.82	0.60
2:B:123:VAL:HB	2:B:332:TRP:HB2	1.83	0.60
1:C:161:THR:HG21	1:C:629:LEU:HD21	1.83	0.60
2:B:64:HIS:O	2:B:188:LYS:NZ	2.34	0.60
2:B:363:ILE:O	2:B:368:LYS:NZ	2.35	0.60
1:C:355:ILE:HG23	1:C:359:MET:HE1	1.83	0.60
2:D:219:ASP:OD2	2:D:229:ARG:NH2	2.35	0.59
1:C:162:PRO:HB3	1:C:198:ALA:HB1	1.84	0.59
1:C:850:TYR:HH	2:D:45:TYR:HH	1.45	0.59
2:D:104:ILE:HD11	2:D:121:LEU:HD21	1.83	0.59
2:D:105:MET:HE2	2:D:315:TYR:HE1	1.67	0.59
1:A:596:TYR:OH	1:A:663:ASP:OD2	2.20	0.59
1:C:719:HIS:HB3	1:C:723:LEU:HD23	1.83	0.59
2:B:264:ILE:O	2:B:286:THR:OG1	2.20	0.59
1:A:89:MET:HE3	1:A:89:MET:O	2.03	0.58
2:B:136:VAL:HG23	2:B:137:PRO:HD3	1.84	0.58
2:B:212:GLY:HA3	2:B:262:LEU:HD21	1.84	0.58
1:A:253:GLU:N	1:A:253:GLU:OE1	2.36	0.58
1:C:359:MET:SD	1:C:376:ARG:NH1	2.77	0.58
1:A:16:LYS:O	1:A:808:ARG:NH1	2.37	0.58
2:B:273:ASP:OD2	2:B:279:ARG:NH2	2.36	0.58
1:C:119:ARG:HE	1:C:675:PRO:HG3	1.69	0.58
2:D:322:LEU:HD11	2:D:334:LEU:HD21	1.86	0.58
2:B:57:ASP:HA	2:B:277:ILE:HG12	1.86	0.57
1:C:253:GLU:HA	1:C:286:PHE:HA	1.86	0.57
1:C:386:ASP:OD1	1:C:542:TYR:OH	2.17	0.57
1:A:362:TYR:O	1:A:370:ASN:ND2	2.38	0.57
1:A:107:ARG:HA	1:A:110:MET:HE1	1.85	0.56
1:C:188:TRP:HA	1:C:191:ILE:HD13	1.86	0.56
1:A:107:ARG:NH1	1:A:110:MET:SD	2.77	0.56
2:B:238:THR:HG22	2:B:271:PHE:HB3	1.87	0.56
1:A:639:ASP:HA	1:A:642:ARG:HG3	1.87	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:352:GLU:HA	2:D:355:LYS:HB3	1.87	0.56
1:A:211:TYR:HD1	1:A:788:GLN:HE22	1.51	0.56
1:C:208:ILE:HG21	1:C:229:ILE:HD12	1.88	0.56
1:A:738:GLN:HG3	1:A:739:VAL:H	1.71	0.56
1:A:232:LEU:O	1:A:252:ARG:NH2	2.38	0.56
1:A:23:GLN:NE2	1:A:25:GLU:OE2	2.36	0.56
2:B:71:VAL:HA	2:B:139:LEU:HD13	1.88	0.56
1:C:536:ARG:NH1	1:C:539:GLU:OE1	2.39	0.56
1:A:209:MET:HE1	1:A:243:THR:HB	1.88	0.56
2:D:46:TYR:HB3	2:D:169:LEU:HD13	1.88	0.56
2:B:47:LEU:HD21	2:B:52:ILE:HG23	1.88	0.55
1:A:347:THR:O	1:A:350:THR:OG1	2.20	0.55
1:C:295:ARG:NH2	1:C:314:GLU:OE2	2.39	0.55
2:B:52:ILE:HD13	2:B:281:VAL:HG12	1.89	0.55
1:C:292:ASN:OD1	1:C:293:ILE:N	2.40	0.55
2:D:28:SER:OG	2:D:38:ASP:O	2.24	0.55
2:B:177:THR:O	2:B:181:ILE:HG12	2.06	0.55
1:A:193:VAL:HG23	1:A:712:VAL:HB	1.88	0.55
1:C:548:GLU:HG2	1:C:554:LYS:HA	1.89	0.55
1:A:110:MET:HA	1:A:113:GLN:CD	2.31	0.55
2:B:166:MET:O	2:B:184:ARG:NH1	2.40	0.55
2:D:104:ILE:HD13	2:D:134:PHE:CZ	2.41	0.55
2:B:326:VAL:HG23	2:B:330:GLN:HB3	1.89	0.54
1:C:42:ASN:ND2	1:C:91:ALA:O	2.40	0.54
1:C:378:LEU:HD11	1:C:603:PHE:HB2	1.89	0.54
2:D:231:ILE:HD11	2:D:268:ILE:HG12	1.88	0.54
2:D:301:GLN:NE2	2:D:302:PRO:O	2.32	0.54
1:A:620:ARG:NH1	1:A:704:ASN:O	2.41	0.54
1:C:352:TRP:HE1	1:C:363:LEU:HD13	1.73	0.54
2:B:82:ALA:O	2:B:86:ILE:HG12	2.07	0.54
1:C:566:MET:HE1	1:C:594:TYR:CE1	2.43	0.54
2:B:26:TYR:HA	2:B:197:ALA:HA	1.88	0.54
1:C:751:LEU:HD23	1:C:754:PHE:HB2	1.90	0.54
2:D:98:ILE:HG23	2:D:132:ILE:HD13	1.90	0.54
1:A:55:ASN:O	1:A:59:HIS:HE1	1.90	0.54
2:B:349:VAL:O	2:B:355:LYS:NZ	2.30	0.54
1:A:226:THR:HG22	1:A:247:HIS:HB3	1.89	0.53
1:C:315:LYS:HZ1	1:C:365:THR:HG22	1.74	0.53
1:C:385:GLU:OE1	1:C:385:GLU:N	2.34	0.53
1:A:329:ASN:OD1	1:A:331:PHE:N	2.39	0.53
1:A:538:TRP:H	1:A:538:TRP:CD1	2.26	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:362:TYR:O	1:C:370:ASN:ND2	2.42	0.53
1:C:667:LYS:HE3	1:C:668:LYS:HB2	1.91	0.53
1:A:759:VAL:HA	1:A:777:SER:HA	1.90	0.53
1:A:168:HIS:HD2	1:A:703:ARG:HG3	1.74	0.52
1:A:337:SER:HB2	1:A:388:ILE:HD11	1.91	0.52
1:A:343:ASN:O	1:A:346:THR:OG1	2.27	0.52
1:C:402:ASN:OD1	1:C:405:ARG:NH1	2.43	0.52
2:D:326:VAL:HG23	2:D:330:GLN:HB2	1.90	0.52
1:A:749:ILE:O	1:A:785:GLU:N	2.41	0.52
2:B:59:SER:HB3	2:B:276:CYS:HB3	1.92	0.52
2:B:71:VAL:HG22	2:B:139:LEU:HB3	1.91	0.52
1:C:163:GLY:O	1:C:703:ARG:NH2	2.32	0.52
1:A:850:TYR:HH	2:B:45:TYR:HH	1.54	0.52
2:D:135:ASN:O	2:D:139:LEU:N	2.40	0.52
1:C:244:HIS:ND1	1:C:314:GLU:OE1	2.43	0.52
1:A:715:ARG:HH11	1:A:780:ASP:HA	1.76	0.51
2:D:105:MET:HE2	2:D:315:TYR:CE1	2.45	0.51
1:A:352:TRP:O	1:A:356:LEU:HG	2.11	0.51
1:A:241:LEU:HD21	1:A:294:LEU:HD22	1.92	0.51
1:C:761:ARG:NH1	1:C:762:LEU:O	2.43	0.51
2:B:354:GLU:OE1	2:B:357:GLN:NE2	2.40	0.51
1:A:168:HIS:HB2	1:A:703:ARG:HD2	1.93	0.51
1:C:864:HIS:HA	1:C:867:GLU:HG2	1.92	0.51
2:B:142:LYS:O	2:B:146:LYS:N	2.44	0.50
2:B:3:LYS:HZ1	2:B:5:LYS:HD3	1.76	0.50
1:C:55:ASN:HA	1:C:58:VAL:HG12	1.92	0.50
1:A:859:ALA:O	1:A:863:ILE:HG12	2.11	0.50
2:B:4:GLU:OE2	2:B:346:LEU:N	2.44	0.50
1:C:669:VAL:HG22	1:C:670:ILE:HG23	1.93	0.50
1:A:34:ARG:NH1	1:A:40:ASP:OD2	2.41	0.50
1:A:644:LEU:HD13	1:A:688:ALA:HB1	1.94	0.50
1:C:798:ILE:HD11	2:D:48:PRO:HB3	1.94	0.50
1:C:165:PRO:HG3	1:C:703:ARG:HH12	1.75	0.50
1:C:641:PHE:HE2	1:C:696:LEU:HD11	1.77	0.50
1:C:608:GLU:N	1:C:608:GLU:OE1	2.41	0.50
1:C:726:GLU:HB3	1:C:732:LYS:HD2	1.93	0.50
2:D:291:LEU:HB2	2:D:292:MET:HE2	1.93	0.50
1:A:39:GLU:N	1:A:39:GLU:OE1	2.45	0.49
1:A:339:ASP:OD1	1:A:341:ARG:NE	2.45	0.49
2:D:43:SER:HB2	2:D:216:CYS:HB3	1.93	0.49
2:D:321:TRP:HZ3	2:D:344:LEU:HD22	1.76	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:136:VAL:CG2	2:B:137:PRO:HD3	2.42	0.49
2:B:259:CYS:SG	2:B:267:ILE:HD11	2.52	0.49
2:D:97:ARG:NH1	2:D:128:GLY:O	2.45	0.49
2:D:332:TRP:HA	2:D:348:GLU:HA	1.94	0.49
1:A:312:ASP:OD1	1:A:314:GLU:HG3	2.12	0.49
1:A:558:LYS:HE3	1:A:562:ILE:HD11	1.93	0.49
1:C:626:MET:O	1:C:656:TYR:OH	2.20	0.49
2:D:250:LYS:HG2	2:D:254:ARG:NH1	2.28	0.49
1:A:402:ASN:O	1:A:406:ARG:NH1	2.45	0.49
1:A:798:ILE:HD11	2:B:48:PRO:HB3	1.95	0.49
2:D:288:ASP:HB3	2:D:292:MET:HE3	1.95	0.48
1:A:386:ASP:OD1	1:A:542:TYR:OH	2.19	0.48
2:B:135:ASN:CG	2:B:137:PRO:HD2	2.38	0.48
1:C:550:LYS:HE3	1:C:665:ASN:HD21	1.78	0.48
2:B:122:ASP:OD1	2:B:123:VAL:N	2.46	0.48
1:A:628:VAL:HG13	1:A:629:LEU:HD22	1.94	0.48
1:C:808:ARG:HB2	1:C:841:TYR:HE2	1.77	0.48
2:D:225:ASP:OD2	2:D:228:SER:OG	2.30	0.48
1:A:49:ASN:HD22	1:A:227:HIS:CE1	2.31	0.48
2:B:21:PRO:HG2	2:B:263:GLY:HA3	1.95	0.48
1:C:8:ARG:HB3	1:C:12:ARG:HH12	1.78	0.48
1:A:312:ASP:HB3	1:A:315:LYS:HB2	1.95	0.48
1:C:340:VAL:HG13	1:C:345:ILE:HD11	1.96	0.48
2:D:104:ILE:HD12	2:D:107:LYS:HD2	1.95	0.48
2:B:267:ILE:HB	2:B:284:PHE:HB2	1.95	0.48
1:C:71:GLU:HG2	1:C:72:THR:HG23	1.95	0.48
1:A:107:ARG:NE	1:A:682:GLU:OE2	2.40	0.47
2:B:349:VAL:HG13	2:B:355:LYS:HG2	1.96	0.47
2:B:138:TYR:CZ	2:B:142:LYS:HD3	2.49	0.47
2:D:58:LEU:N	2:D:276:CYS:O	2.44	0.47
1:C:334:HIS:ND1	1:C:338:LEU:O	2.44	0.47
2:D:161:TYR:O	2:D:164:GLU:HG3	2.14	0.47
1:C:358:THR:OG1	1:C:376:ARG:NH1	2.44	0.47
1:A:533:GLU:O	1:A:534:GLU:HG3	2.14	0.47
1:A:752:GLN:HG2	1:A:754:PHE:H	1.79	0.47
2:B:204:SER:OG	2:B:205:ARG:N	2.46	0.47
1:C:34:ARG:HD2	1:C:35:PRO:HD2	1.95	0.47
1:C:203:GLU:OE1	1:C:205:GLU:HG3	2.14	0.47
1:C:246:PRO:HD2	1:C:802:LEU:HD11	1.97	0.47
2:D:333:LYS:N	2:D:347:LYS:O	2.48	0.47
1:A:259:ASP:N	1:A:259:ASP:OD1	2.45	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:121:LEU:HB2	2:D:334:LEU:HB2	1.97	0.47
1:A:115:SER:HB3	1:A:675:PRO:HG2	1.96	0.47
1:A:640:VAL:HG12	1:A:692:LYS:HD3	1.96	0.47
2:B:121:LEU:HB2	2:B:334:LEU:HB3	1.96	0.47
1:A:117:ARG:HG3	1:A:628:VAL:HG22	1.96	0.47
1:A:250:ILE:HB	1:A:289:LEU:HD23	1.97	0.47
1:C:107:ARG:HH11	1:C:110:MET:HB2	1.80	0.47
1:A:654:ASP:OD1	1:A:654:ASP:N	2.49	0.46
1:C:37:ARG:NH1	1:C:40:ASP:OD1	2.48	0.46
2:B:251:LYS:O	2:B:254:ARG:HG2	2.16	0.46
1:A:164:THR:O	1:A:167:MET:HG3	2.16	0.46
1:A:355:ILE:O	1:A:359:MET:HG3	2.15	0.46
1:C:54:MET:HE3	1:C:54:MET:HA	1.97	0.46
1:C:399:SER:HA	1:C:402:ASN:ND2	2.31	0.46
1:C:535:ILE:HD12	1:C:546:TYR:HA	1.97	0.46
1:A:60:PRO:HB3	1:A:70:PRO:HG2	1.98	0.46
1:C:28:ASP:N	1:C:28:ASP:OD1	2.49	0.46
1:A:54:MET:HA	1:A:54:MET:HE3	1.98	0.46
1:A:172:ASP:HA	1:A:175:ARG:HD3	1.98	0.46
1:C:393:TYR:CZ	1:C:397:LYS:HD3	2.51	0.46
1:A:110:MET:O	1:A:114:ARG:HG3	2.16	0.45
1:A:553:THR:HG21	1:A:558:LYS:HG2	1.98	0.45
1:C:655:PHE:HB3	1:C:680:ILE:HD12	1.99	0.45
2:D:177:THR:OG1	2:D:180:GLU:OE1	2.23	0.45
1:C:543:ARG:HE	1:C:543:ARG:HB3	1.67	0.45
1:A:378:LEU:HD13	1:A:603:PHE:CG	2.52	0.45
1:A:351:ILE:HG22	1:A:377:LEU:HD12	1.98	0.45
1:A:326:PHE:CZ	1:A:574:VAL:HG21	2.52	0.45
1:A:652:ILE:HG22	1:A:684:ARG:HG2	1.97	0.45
2:B:121:LEU:N	2:B:334:LEU:O	2.47	0.45
2:D:5:LYS:HB3	2:D:346:LEU:HB3	1.99	0.45
2:B:29:ARG:HA	2:B:35:THR:HA	1.98	0.45
2:B:257:ALA:O	2:B:261:LEU:HD23	2.16	0.45
1:C:733:ASP:OD1	1:C:733:ASP:N	2.49	0.45
1:C:51:TYR:OH	1:C:227:HIS:ND1	2.46	0.45
2:D:270:GLY:HA2	2:D:281:VAL:HG12	1.98	0.45
2:B:104:ILE:HD12	2:B:104:ILE:H	1.82	0.45
2:B:105:MET:O	2:B:109:LEU:HD23	2.17	0.45
1:C:669:VAL:HG13	1:C:670:ILE:N	2.32	0.45
1:C:808:ARG:HB2	1:C:841:TYR:CE2	2.51	0.45
2:B:5:LYS:HG2	2:B:321:TRP:HE1	1.82	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:227:HIS:HB2	1:A:248:PHE:CD1	2.51	0.44
1:A:384:LYS:HE2	1:A:384:LYS:HB3	1.74	0.44
2:B:58:LEU:HA	2:B:162:LYS:HG2	1.99	0.44
1:A:246:PRO:HD2	1:A:802:LEU:HD11	1.99	0.44
1:A:712:VAL:HG22	1:A:783:MET:HB3	1.99	0.44
1:C:71:GLU:OE1	1:C:71:GLU:N	2.51	0.44
1:C:101:VAL:O	1:C:207:LYS:NZ	2.40	0.44
2:D:26:TYR:HA	2:D:197:ALA:HA	1.99	0.44
2:B:337:ALA:H	2:B:340:ASN:ND2	2.15	0.44
1:A:814:LYS:HB2	1:A:814:LYS:HE2	1.86	0.44
2:B:87:GLU:HA	2:B:90:SER:OG	2.18	0.44
1:A:119:ARG:HH12	1:A:671:TRP:HA	1.82	0.44
2:B:274:ASP:OD1	2:B:274:ASP:N	2.48	0.44
1:C:558:LYS:HA	1:C:561:LYS:HE2	1.99	0.44
1:A:771:ARG:CG	1:A:772:HIS:H	2.26	0.44
2:B:319:VAL:O	2:B:323:ASN:ND2	2.51	0.44
1:C:567:VAL:HG13	1:C:603:PHE:HD1	1.83	0.44
1:C:715:ARG:HG2	1:C:720:TYR:CE2	2.53	0.44
1:A:6:LEU:HD11	1:A:234:ALA:HB1	2.00	0.43
1:C:329:ASN:OD1	1:C:331:PHE:N	2.38	0.43
1:C:717:HIS:HE1	1:C:719:HIS:CD2	2.32	0.43
1:C:771:ARG:HH21	1:C:772:HIS:HB3	1.83	0.43
2:D:84:LYS:HE2	2:D:88:LYS:HE3	2.00	0.43
1:A:84:THR:HA	1:A:87:VAL:HG12	1.99	0.43
2:B:35:THR:HG21	2:B:78:PRO:HB3	1.99	0.43
1:C:292:ASN:HB2	1:C:805:HIS:CE1	2.52	0.43
2:D:177:THR:O	2:D:181:ILE:HG12	2.18	0.43
1:A:536:ARG:HH21	1:A:538:TRP:HE1	1.67	0.43
2:B:109:LEU:HG	2:B:261:LEU:HD21	2.00	0.43
1:C:110:MET:O	1:C:114:ARG:HG3	2.18	0.43
2:B:111:LEU:HD23	2:B:111:LEU:HA	1.89	0.43
1:A:856:GLY:O	1:A:858:LYS:N	2.52	0.43
2:B:372:SER:HA	2:B:375:ARG:HH21	1.82	0.43
1:C:169:ARG:O	1:C:173:SER:OG	2.24	0.43
1:A:215:LEU:O	1:A:221:HIS:ND1	2.52	0.43
1:A:251:LEU:HD12	1:A:288:TRP:CH2	2.53	0.43
2:D:27:PHE:HB2	2:D:35:THR:HG23	1.99	0.43
1:A:354:GLN:O	1:A:357:PRO:HD2	2.19	0.43
2:B:179:LYS:HD2	2:B:179:LYS:HA	1.72	0.43
2:D:13:SER:H	2:D:313:ASN:HB3	1.83	0.43
2:D:292:MET:HE2	2:D:292:MET:N	2.34	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:164:THR:HG23	1:A:167:MET:H	1.84	0.43
1:A:766:GLN:NE2	1:A:771:ARG:O	2.51	0.43
1:A:797:MET:HG2	2:B:173:TRP:HZ2	1.83	0.43
2:B:118:ASP:OD1	2:B:338:LYS:N	2.52	0.43
2:B:292:MET:N	2:B:292:MET:HE2	2.34	0.43
2:B:333:LYS:N	2:B:347:LYS:O	2.40	0.43
1:C:97:ILE:HB	1:C:193:VAL:HG22	2.01	0.43
1:A:180:TYR:HD1	1:A:776:ILE:HD11	1.84	0.42
2:D:17:MET:O	2:D:203:ILE:HG13	2.19	0.42
1:A:281:ASP:OD1	1:A:281:ASP:N	2.52	0.42
2:B:43:SER:OG	2:B:168:THR:HB	2.19	0.42
1:C:391:LYS:HD3	1:C:391:LYS:HA	1.86	0.42
1:A:568:GLN:HG3	1:A:609:LEU:HD11	2.02	0.42
1:C:176:TYR:CZ	1:C:762:LEU:HB2	2.55	0.42
1:C:654:ASP:OD1	1:C:654:ASP:N	2.52	0.42
1:A:771:ARG:HG2	1:A:772:HIS:N	2.29	0.42
1:C:28:ASP:CG	1:C:29:ILE:HD12	2.44	0.42
1:C:854:GLN:HG2	2:D:279:ARG:HB3	2.02	0.42
1:A:302:LEU:HD22	1:A:352:TRP:HZ3	1.85	0.42
1:C:649:ASN:O	1:C:649:ASN:ND2	2.29	0.42
1:C:759:VAL:HA	1:C:777:SER:HA	2.01	0.42
1:C:8:ARG:O	1:C:12:ARG:HG2	2.20	0.42
1:C:73:GLU:O	1:C:77:MET:HG2	2.20	0.42
2:D:7:LEU:HB2	2:D:321:TRP:CE2	2.54	0.42
2:D:288:ASP:O	2:D:292:MET:HG2	2.19	0.42
1:A:125:LYS:HB3	1:A:125:LYS:HE3	1.92	0.42
2:B:239:ILE:HD11	2:B:248:PHE:CG	2.54	0.42
2:D:119:PHE:HA	2:D:138:TYR:CZ	2.55	0.42
1:A:352:TRP:HE1	1:A:363:LEU:HD13	1.85	0.42
2:B:106:ARG:HD2	2:B:258:GLN:NE2	2.35	0.42
2:B:242:TYR:HA	2:B:245:MET:HG3	2.02	0.42
2:B:369:GLU:O	2:B:372:SER:OG	2.20	0.42
1:A:713:LEU:HD11	1:A:717:HIS:CG	2.55	0.41
2:D:135:ASN:ND2	2:D:137:PRO:HD2	2.35	0.41
1:A:50:LEU:HB3	1:A:97:ILE:HD13	2.03	0.41
2:B:332:TRP:CD2	2:B:348:GLU:HB3	2.55	0.41
1:A:292:ASN:HB2	1:A:805:HIS:CE1	2.54	0.41
1:A:302:LEU:HD22	1:A:352:TRP:CZ3	2.55	0.41
1:C:34:ARG:HE	1:C:37:ARG:NH2	2.19	0.41
1:C:355:ILE:HD11	1:C:376:ARG:HB3	2.02	0.41
2:D:250:LYS:HG2	2:D:254:ARG:HH12	1.85	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:51:TYR:OH	1:A:227:HIS:ND1	2.44	0.41
1:C:307:LEU:HD12	1:C:309:PHE:CE1	2.55	0.41
2:D:252:LEU:HD22	2:D:269:TYR:HE2	1.85	0.41
1:A:579:LEU:HB2	1:A:586:PRO:HG3	2.03	0.41
2:B:18:LEU:HD13	2:B:260:PHE:CZ	2.56	0.41
2:B:320:GLU:HA	2:B:323:ASN:HD21	1.86	0.41
2:D:57:ASP:OD1	2:D:58:LEU:N	2.53	0.41
1:A:76:MET:HE3	1:A:76:MET:HB2	1.93	0.41
1:A:167:MET:SD	1:A:168:HIS:N	2.94	0.41
1:A:545:ARG:O	1:A:549:THR:OG1	2.27	0.41
1:C:117:ARG:HB3	1:C:630:PRO:HD3	2.03	0.41
1:C:302:LEU:HD11	1:C:320:TRP:HB2	2.03	0.41
2:D:79:ILE:O	2:D:83:LEU:HD23	2.21	0.41
2:D:366:TRP:O	2:D:369:GLU:HG3	2.21	0.41
1:A:626:MET:O	1:A:656:TYR:OH	2.27	0.41
2:B:102:ARG:HG3	2:B:258:GLN:HE22	1.85	0.41
1:C:221:HIS:HA	1:C:739:VAL:HG21	2.02	0.41
1:C:332:LEU:HD21	1:C:590:TRP:HH2	1.86	0.41
1:A:66:HIS:CD2	1:A:66:HIS:H	2.37	0.41
1:A:159:ALA:O	1:A:164:THR:HG21	2.21	0.41
1:A:717:HIS:HE2	1:A:742:SER:HG	1.67	0.41
2:B:288:ASP:O	2:B:292:MET:HG2	2.21	0.41
1:C:566:MET:HE1	1:C:594:TYR:CZ	2.56	0.41
2:D:149:ASP:HB3	2:D:153:HIS:HE1	1.86	0.41
1:A:52:LEU:HB2	1:A:99:ILE:HD13	2.02	0.41
1:A:54:MET:HB2	1:A:101:VAL:HG22	2.03	0.41
1:A:250:ILE:HB	1:A:289:LEU:HB3	2.02	0.41
1:A:631:ALA:HA	1:A:645:MET:HE1	2.02	0.41
2:B:147:GLN:O	2:B:150:THR:N	2.53	0.41
2:D:102:ARG:NH1	2:D:262:LEU:HD12	2.36	0.41
1:C:251:LEU:HB2	1:C:288:TRP:CZ3	2.56	0.40
1:A:726:GLU:HB3	1:A:732:LYS:HD2	2.03	0.40
1:C:192:GLU:OE1	1:C:192:GLU:N	2.54	0.40
1:C:401:GLU:HA	1:C:404:LYS:HB2	2.02	0.40
2:D:248:PHE:O	2:D:252:LEU:HD23	2.21	0.40
2:B:97:ARG:HH21	2:B:130:LEU:HD21	1.86	0.40
1:C:550:LYS:HE3	1:C:665:ASN:ND2	2.36	0.40
1:C:670:ILE:HA	1:C:673:ALA:HB2	2.04	0.40
2:D:136:VAL:HG12	2:D:140:LYS:NZ	2.36	0.40
1:C:6:LEU:HD12	1:C:6:LEU:H	1.86	0.40
1:C:859:ALA:O	1:C:863:ILE:HG12	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:D:169:LEU:HD23	2:D:176:CYS:SG	2.62	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

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

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

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	677/1006 (67%)	644 (95%)	33 (5%)	0	100	100
1	C	660/1006 (66%)	635 (96%)	25 (4%)	0	100	100
2	B	365/384 (95%)	344 (94%)	21 (6%)	0	100	100
2	D	375/384 (98%)	363 (97%)	12 (3%)	0	100	100
All	All	2077/2780 (75%)	1986 (96%)	91 (4%)	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	618/879 (70%)	618 (100%)	0	100	100
1	C	604/879 (69%)	603 (100%)	1 (0%)	92	96
2	B	339/348 (97%)	339 (100%)	0	100	100
2	D	344/348 (99%)	344 (100%)	0	100	100

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles
All	All	1905/2454 (78%)	1904 (100%)	1 (0%)	92 97

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	C	649	ASN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (21) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	23	GLN
1	A	49	ASN
1	A	59	HIS
1	A	128	ASN
1	A	738	GLN
2	B	23	GLN
2	B	32	ASN
2	B	135	ASN
2	B	145	GLN
2	B	295	ASN
2	B	299	ASN
2	B	323	ASN
2	B	340	ASN
2	B	353	ASN
1	C	44	ASN
1	C	583	GLN
1	C	690	GLN
2	D	133	GLN
2	D	295	ASN
2	D	323	ASN
2	D	353	ASN

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 (i)

There are no oligosaccharides in this entry.

5.6 Ligand geometry (i)

There are no ligands in this entry.

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.

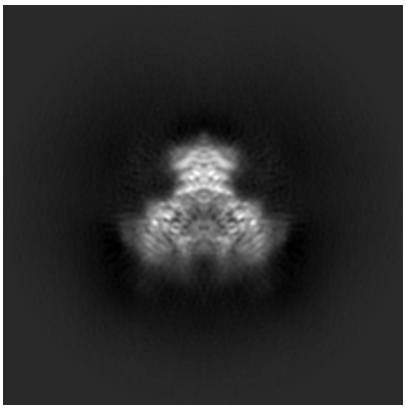
6 Map visualisation (i)

This section contains visualisations of the EMDB entry EMD-39221. These allow visual inspection of the internal detail of the map and identification of artifacts.

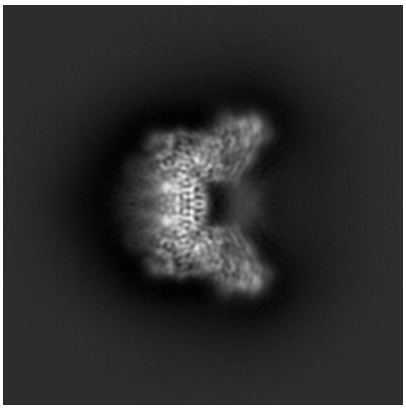
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections (i)

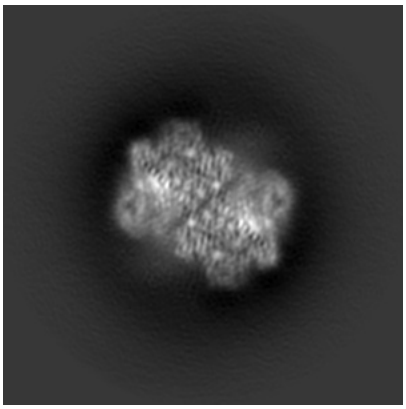
6.1.1 Primary map



X

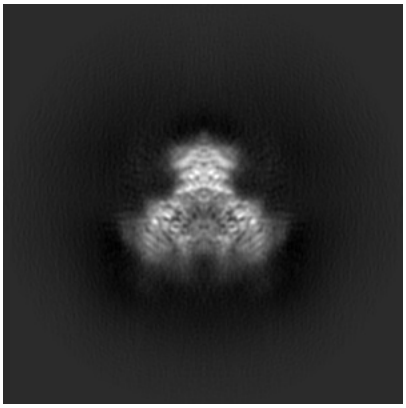


Y

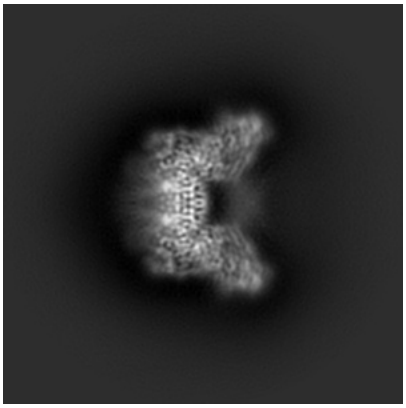


Z

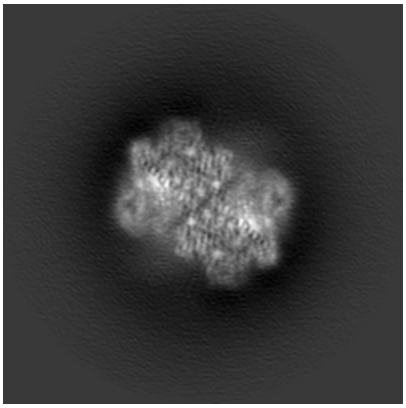
6.1.2 Raw map



X



Y

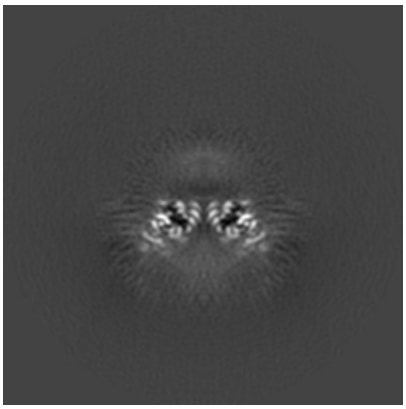


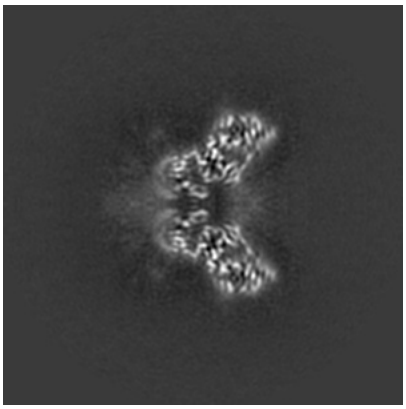
Z

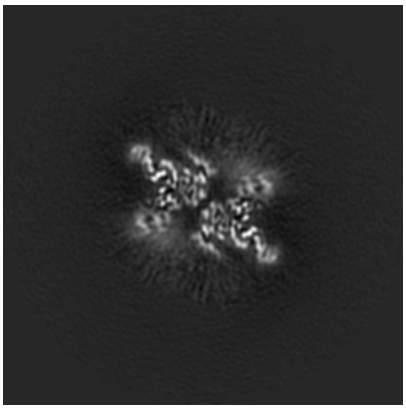
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

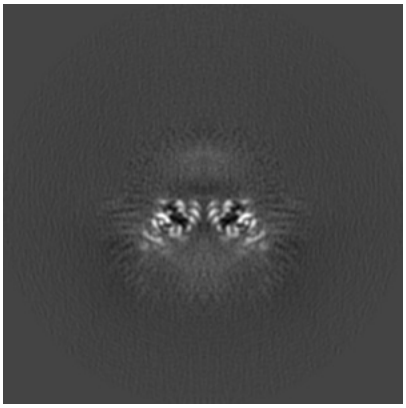
6.2.1 Primary map

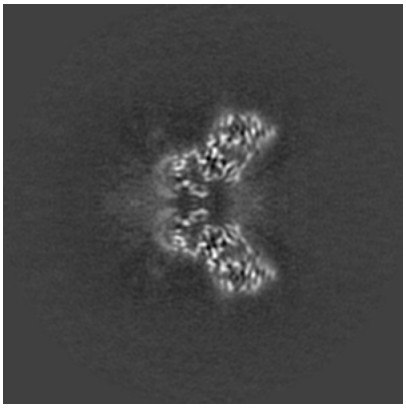

X Index: 100

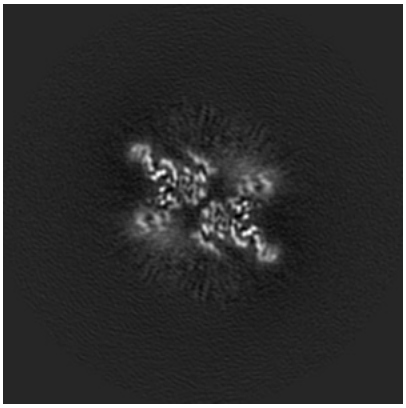

Y Index: 100


Z Index: 100

6.2.2 Raw map


X Index: 100

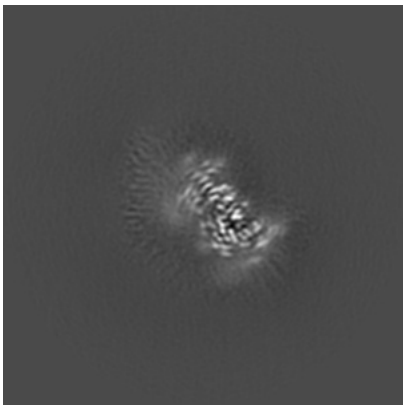

Y Index: 100


Z Index: 100

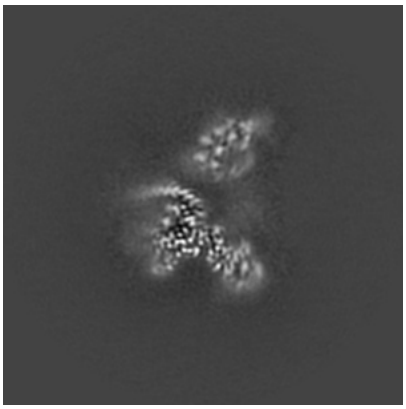
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

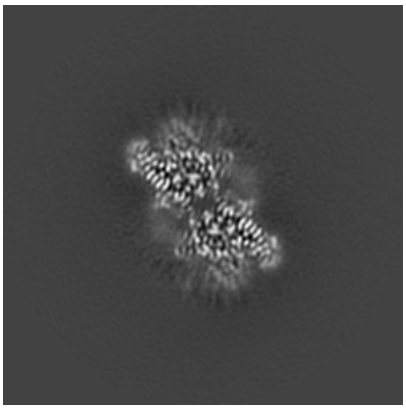
6.3.1 Primary map



X Index: 81

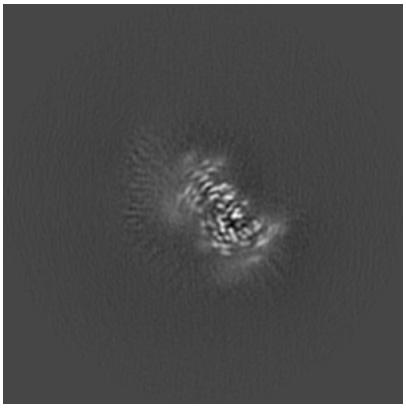


Y Index: 109

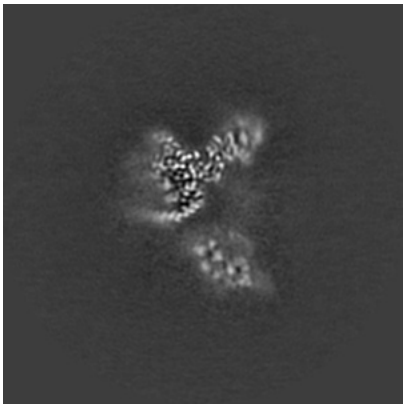


Z Index: 90

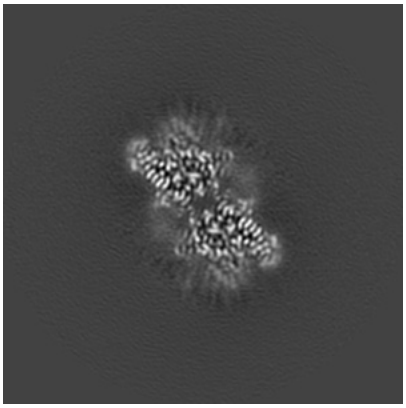
6.3.2 Raw map



X Index: 81



Y Index: 90

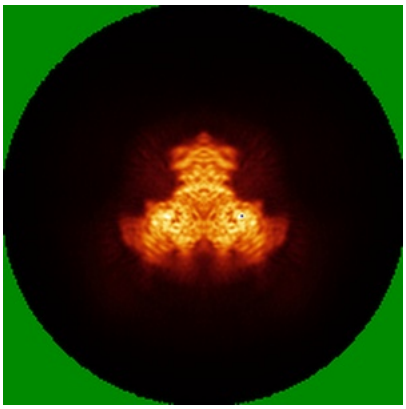


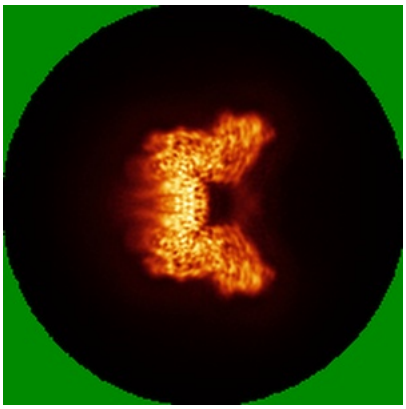
Z Index: 90

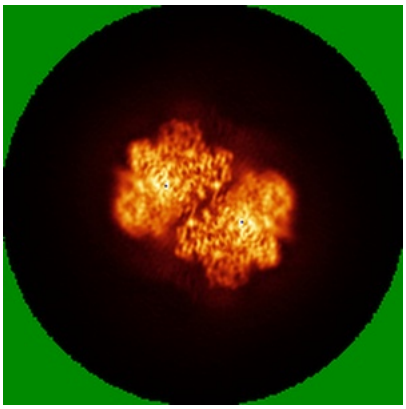
The images above show the largest variance slices of the map in three orthogonal directions.

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

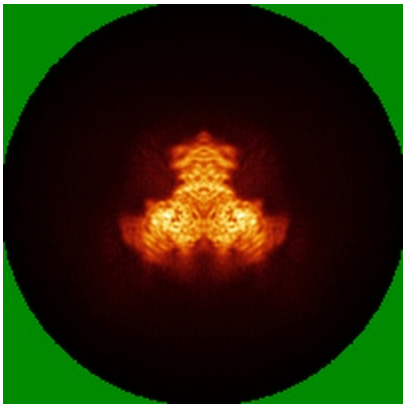
6.4.1 Primary map

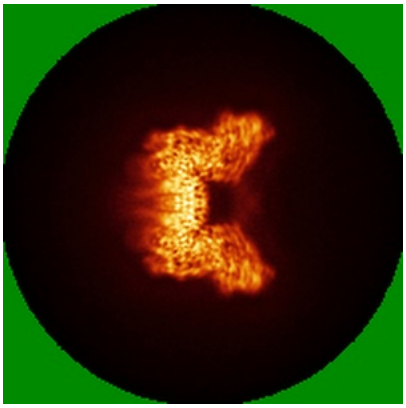

X

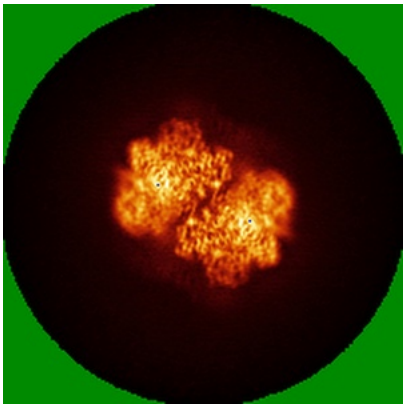

Y


Z

6.4.2 Raw map


X

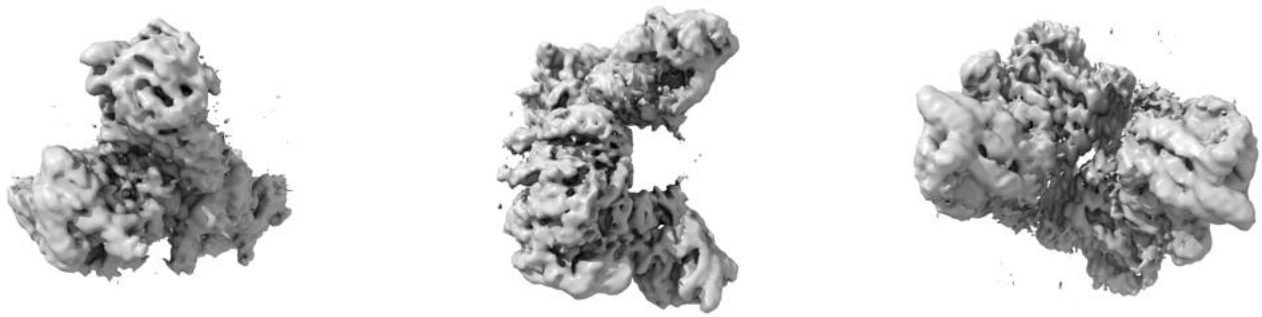

Y


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)

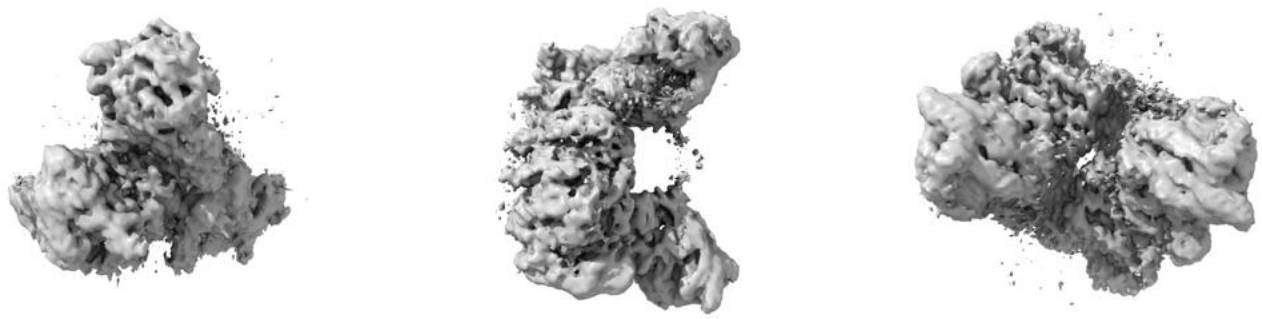
6.5.1 Primary map



X Y Z

The images above show the 3D surface view of the map at the recommended contour level 0.013. 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.

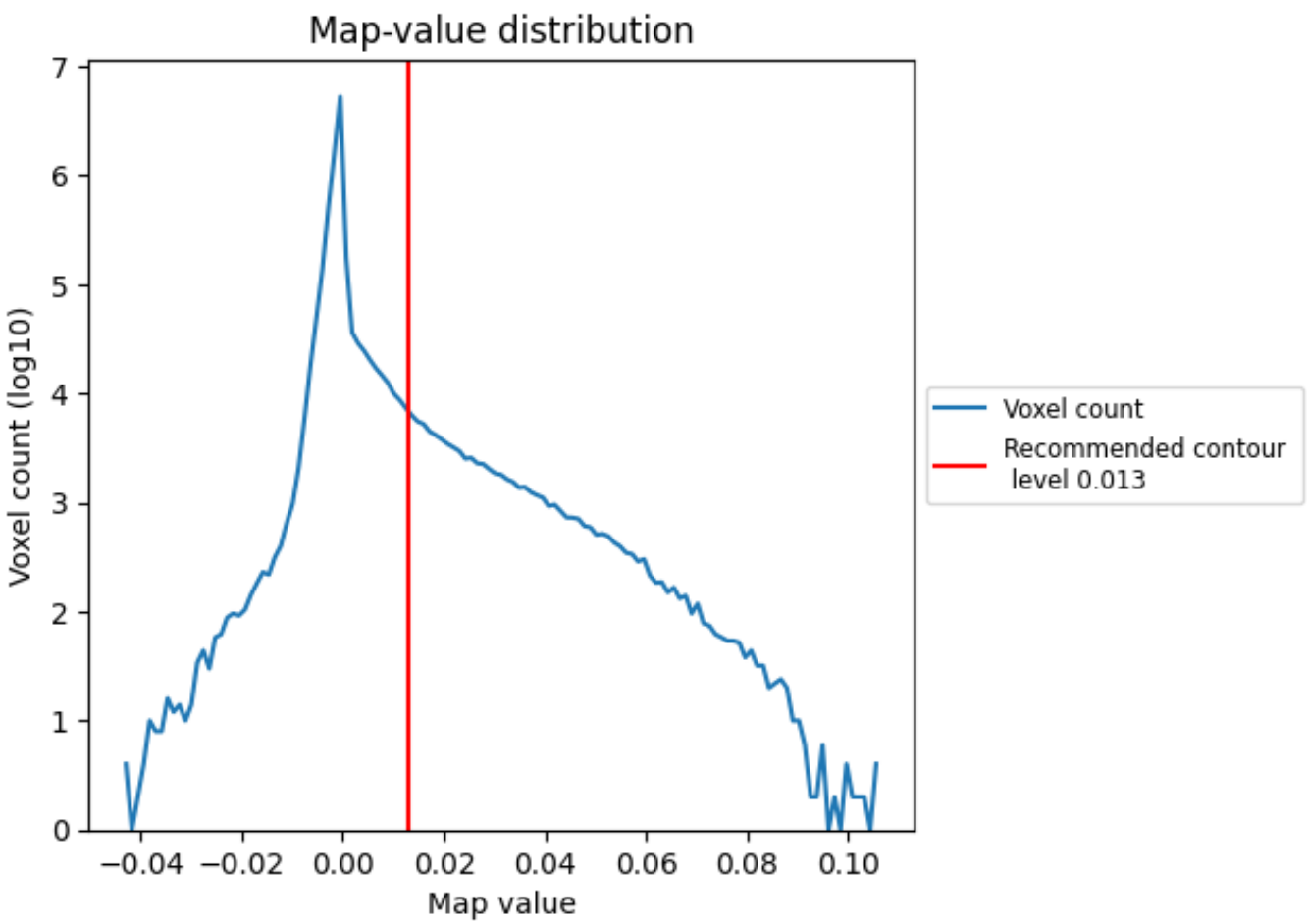
6.6 Mask visualisation (i)

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

7 Map analysis (i)

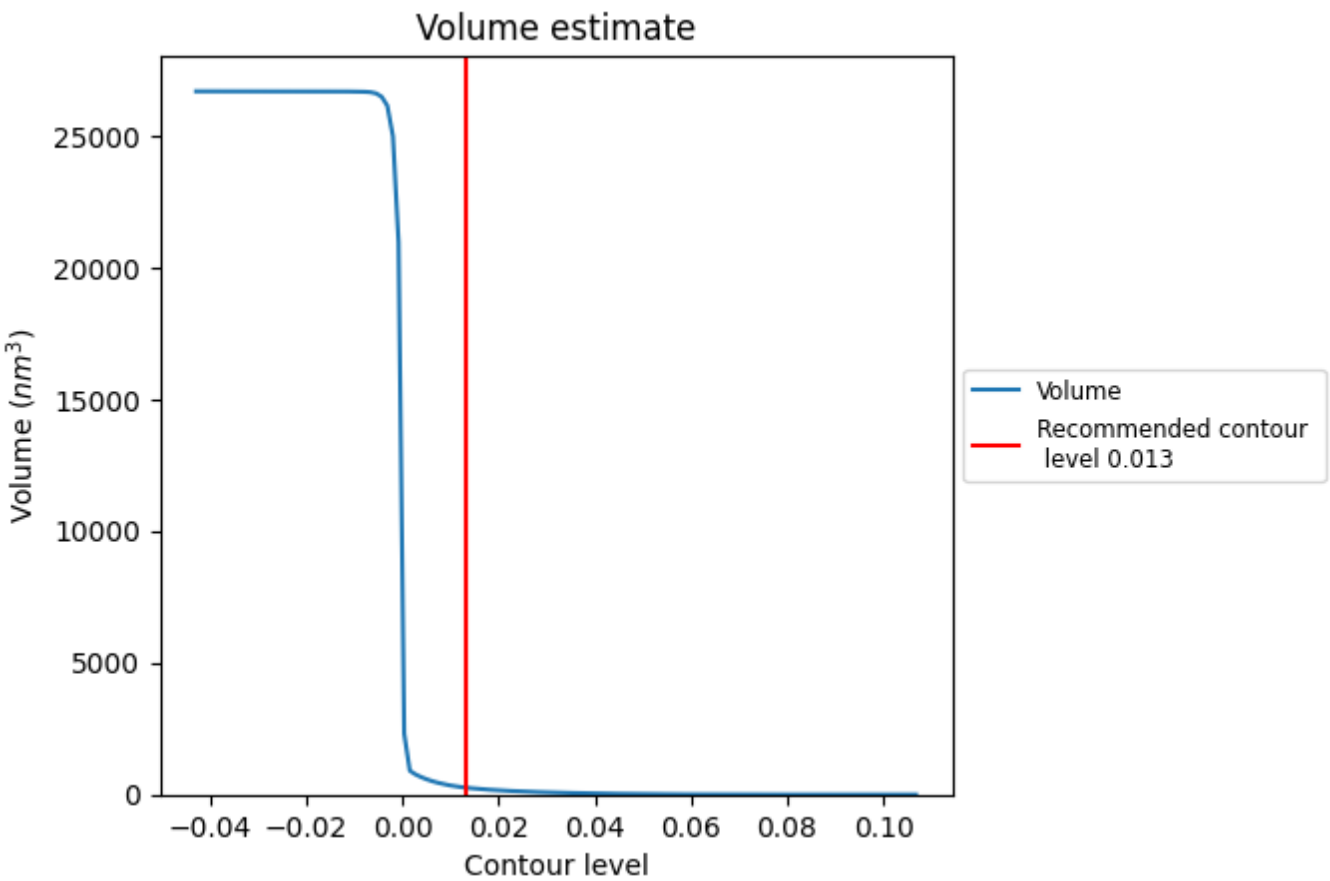
This section contains the results of statistical analysis of the map.

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.

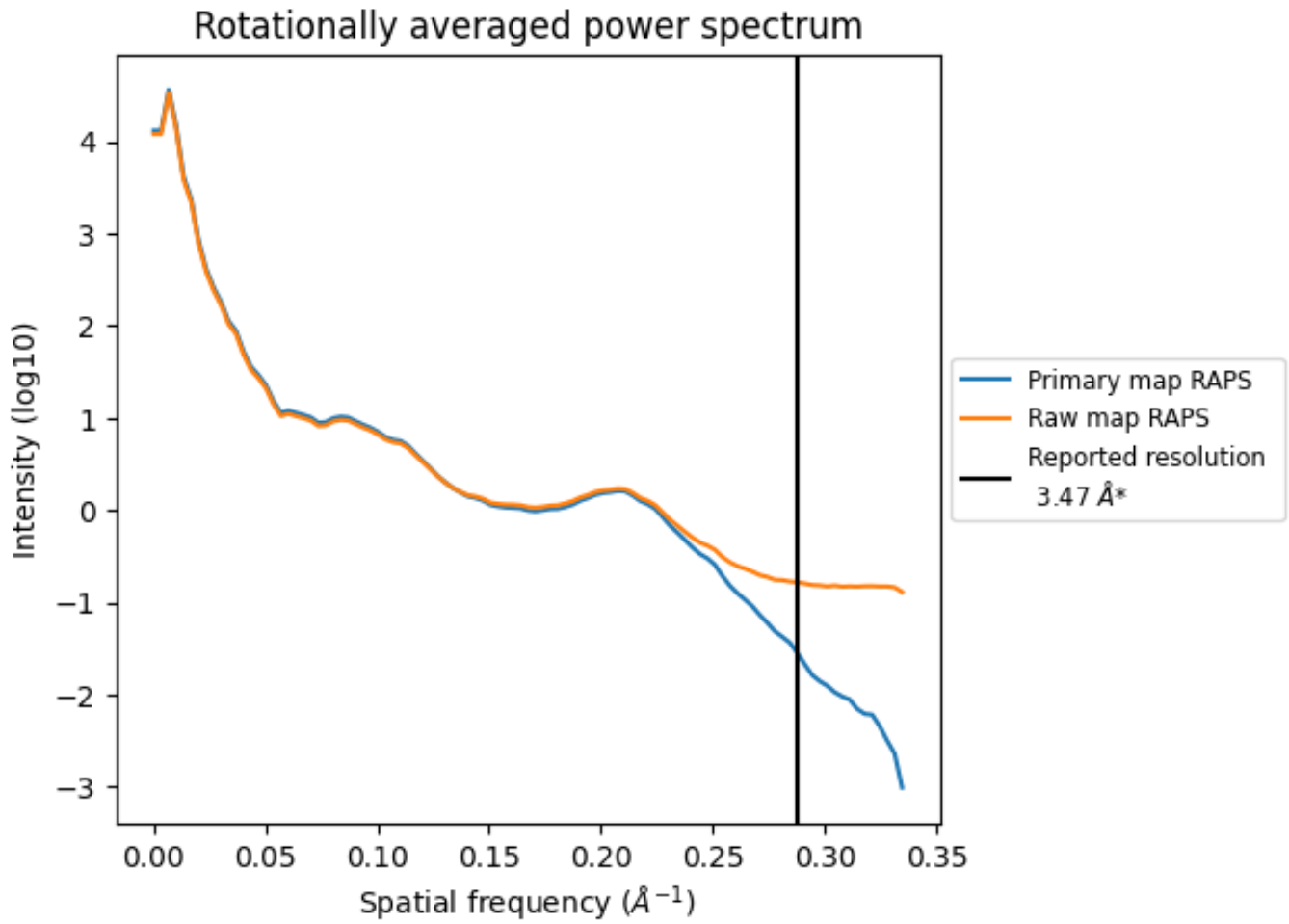
7.2 Volume estimate (i)



The volume at the recommended contour level is 267 nm^3; this corresponds to an approximate mass of 241 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)

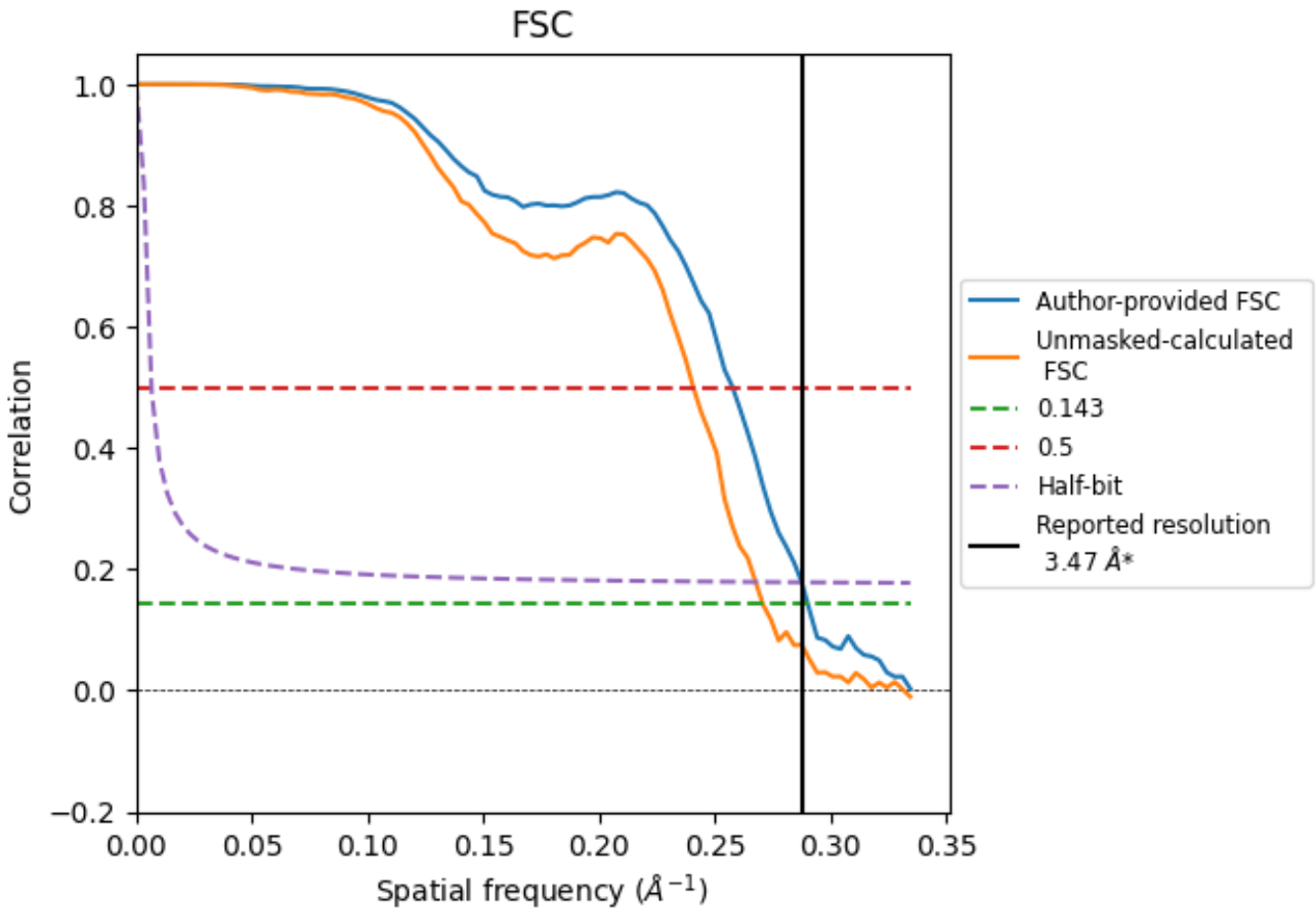


*Reported resolution corresponds to spatial frequency of 0.288 Å^{-1}

8 Fourier-Shell correlation (i)

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 (i)



*Reported resolution corresponds to spatial frequency of 0.288 Å^{-1}

8.2 Resolution estimates (i)

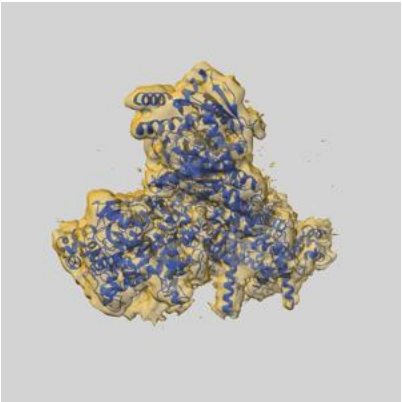
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.47	-	-
Author-provided FSC curve	3.44	3.88	3.47
Unmasked-calculated*	3.69	4.15	3.73

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

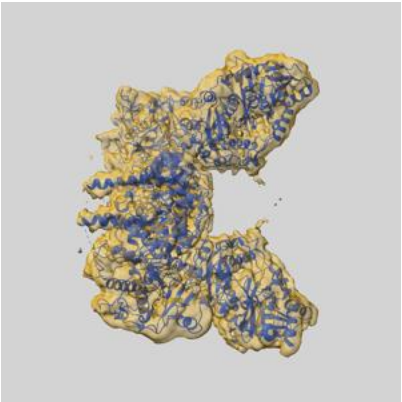
9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-39221 and PDB model 8YFE. Per-residue inclusion information can be found in section 3 on page 5.

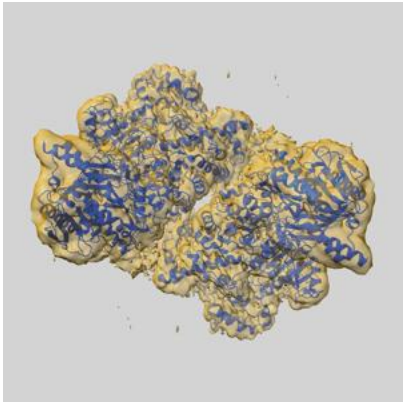
9.1 Map-model overlay (i)



X



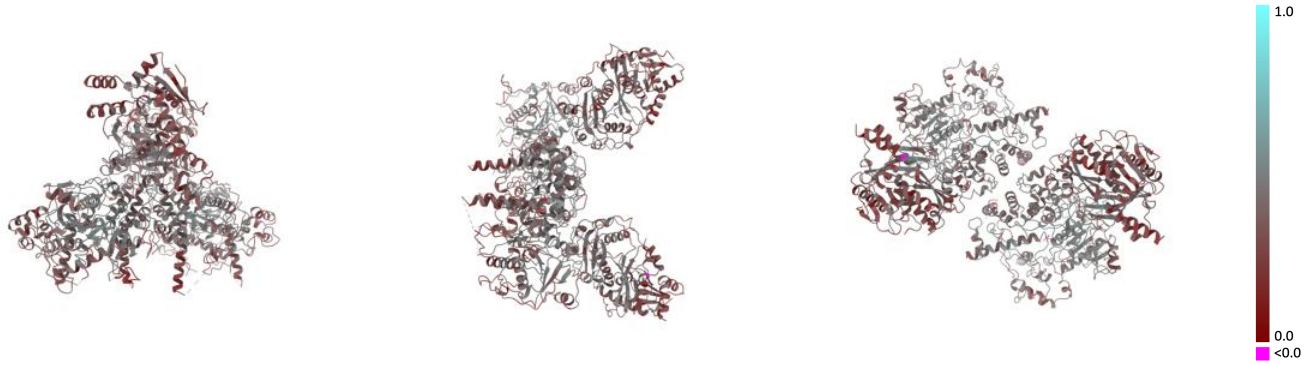
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.013 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

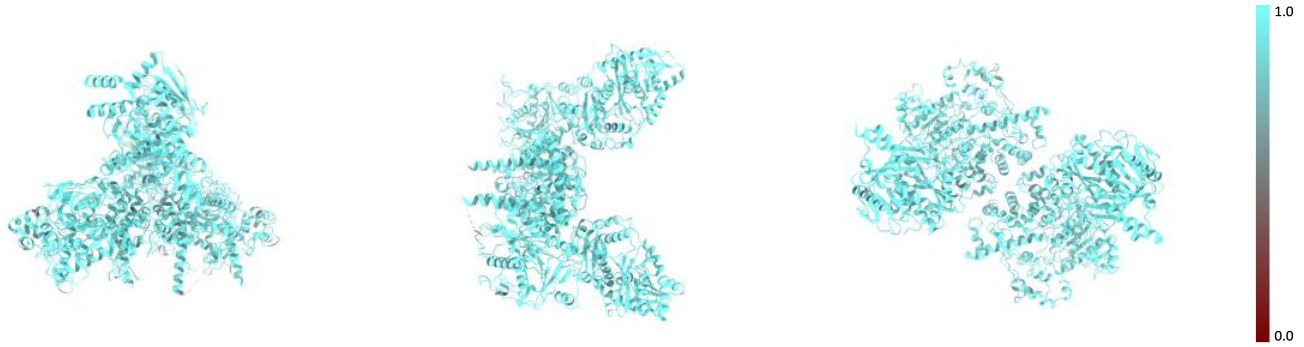
9.2 Q-score mapped to coordinate model (i)



X Y Z

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

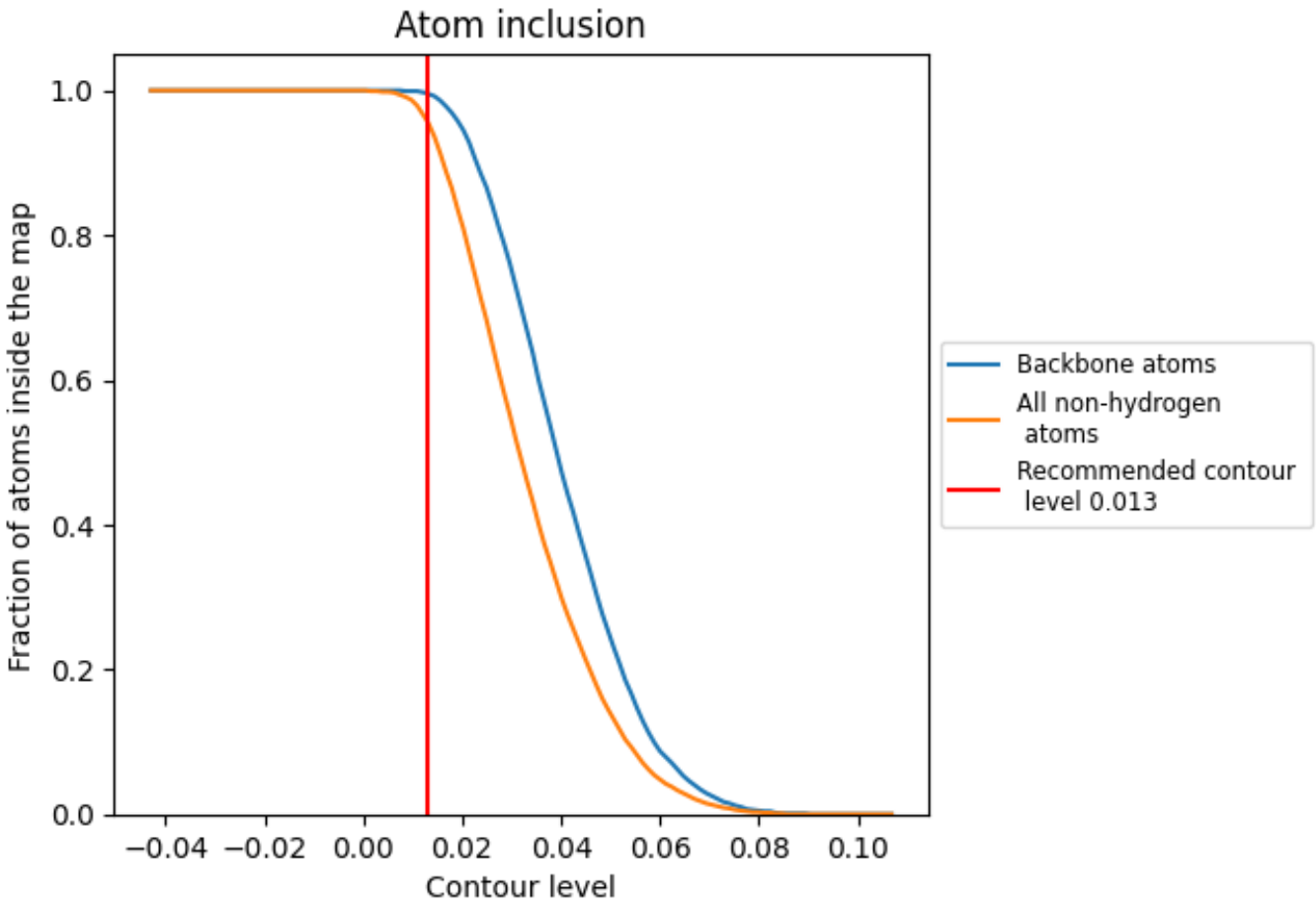
9.3 Atom inclusion mapped to coordinate model (i)



X Y Z

The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.013).

9.4 Atom inclusion (i)



At the recommended contour level, 100% of all backbone atoms, 96% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.013) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9570	0.3880
A	0.9540	0.4020
B	0.9630	0.3560
C	0.9540	0.4080
D	0.9630	0.3550