



# Full wwPDB EM Validation Report ⓘ

Oct 15, 2024 – 03:19 AM EDT

PDB ID : 8VRB  
EMDB ID : EMD-43480  
Title : Structure of a synthetic antibody in complex with a class I MHC presenting a hapten-peptide conjugate  
Authors : Maso, L.; Bang, I.; Koide, S.  
Deposited on : 2024-01-20  
Resolution : 3.25 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](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/EMValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev113  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4.02b-467  
buster-report : 1.1.7 (2018)  
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) : 2.39

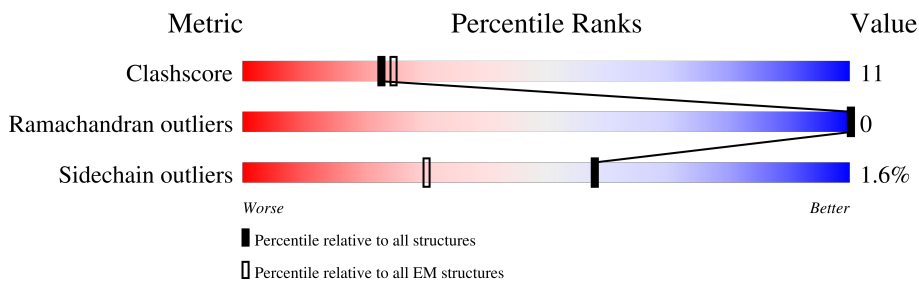
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.25 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  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	274	
2	B	100	
3	C	10	
4	D	216	
5	E	228	

## 2 Entry composition [i](#)

There are 6 unique types of molecules in this entry. The entry contains 4843 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 HLA-A antigen.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	274	2235	1389	407	430	9	0	0

- Molecule 2 is a protein called Beta-2-microglobulin.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	99	828	528	140	157	3	0	0

- Molecule 3 is a protein called GTPase KRas, N-terminally processed.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	10	60	38	11	10	1	0	0

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	12	CYS	GLY	variant	UNP P01116

- Molecule 4 is a protein called R023 Fab light chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	D	106	803	504	136	160	3	0	0

- Molecule 5 is a protein called R023 Fab heavy chain.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	E	117	876	551	148	173	4	0	0

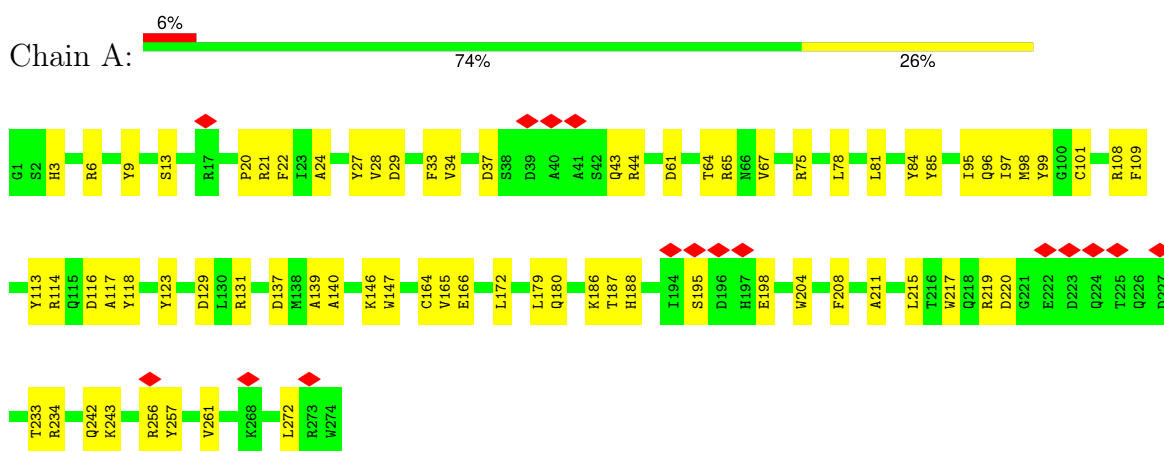
- Molecule 6 is AMG 510 (bound form) (three-letter code: MOV) (formula: C<sub>30</sub>H<sub>32</sub>F<sub>2</sub>N<sub>6</sub>O<sub>3</sub>)



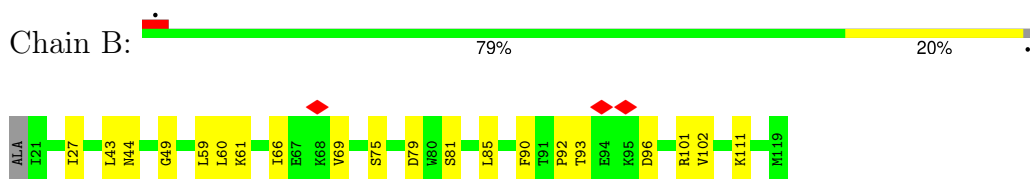
### 3 Residue-property plots [i](#)

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: HLA-A antigen



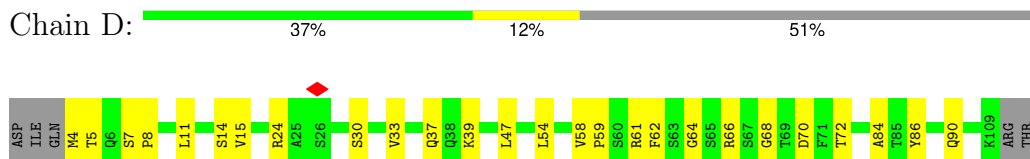
- Molecule 2: Beta-2-microglobulin



- Molecule 3: GTPase KRas, N-terminally processed



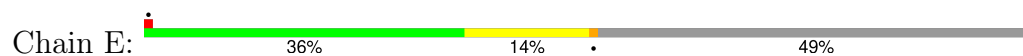
- Molecule 4: R023 Fab light chain



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

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

● Molecule 5: R023 Fab heavy chain



GLU ILE SER  
ASN E1  
GLN V2  
ILE Q3  
LYS L4  
GLY V5  
SER E6  
SER S7  
VAL VAL  
PHE L11  
PRO V12  
LEU L20  
ALA L25  
SER S25  
SER F29  
GLN S33  
THR Q39  
GLY L45  
THR L51  
ALA L54  
GLY S54  
CYS S55  
LEU D62  
LYS R67  
LYS A72  
PRO S75  
GLU K76  
PRO N77  
VAL T78  
THR A79  
SER M83  
TRP N84  
SER S85  
CYS L86  
GLY R87  
ALA LEU  
THR T91  
SER C96  
GLY G99  
VAL G109  
HIS T112  
THR PHE  
SER PRO  
VAL ALA  
LEU V113  
SER V114

T115  
SER V116  
GLY F117  
LEU ILE  
TYR ILE  
SER LYS  
LEU GLY  
SER PRO  
SER VAL  
VAL PHE  
THR PRO  
VAL LEU  
PRO ALA  
SER PRO  
SER SER  
SER SER  
LEU LYS  
GLY SER  
THR THR  
GLN THR  
THR GLY  
TYR GLY  
ILE THR  
CYS ALA  
ASN ALA  
VAL LEU  
ASN GLY  
HIS CYS  
LYS LEU  
PRO VAL  
SER LYS  
SER ASN  
THR TYR  
LYS PHE  
VAL PRO  
ASP GLU  
LYS PRO  
LYS VAL  
VAL THR  
GLU VAL  
PRO SER  
LYS TRP  
SER ASN  
CYS SER  
ASP GLY  
LYS ALA  
THR LEU  
HIS THR  
THR SER  
GLY VAL  
VAL HIS  
THR THR  
PHE PHE  
PRO PRO  
ALA ALA  
VAL VAL  
LEU LEU

GLN SER  
SER SER  
GLY SER  
LEU TYR  
SER TYR  
LEU SER  
SER PRO  
SER VAL  
VAL VAL  
THR THR  
VAL VAL  
PRO PRO  
SER SER  
SER SER  
LEU LEU  
GLY LEU  
THR THR  
GLN THR  
THR THR  
TYR TYR  
ILE ILE  
CYS CYS  
ASN ASN  
VAL VAL  
ASN ASN  
HIS HIS  
LYS LYS  
PRO PRO  
SER SER  
SER ASN  
THR THR  
LYS LYS  
VAL VAL  
ASP ASP  
LYS LYS  
LYS LYS  
VAL VAL  
GLU GLU  
PRO PRO  
LYS LYS  
SER SER  
CYS CYS  
ASP ASP  
LYS LYS  
THR THR  
HIS HIS  
THR THR

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	90612	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	57.56	Depositor
Minimum defocus (nm)	900	Depositor
Maximum defocus (nm)	2400	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	3.262	Depositor
Minimum map value	-1.987	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.049	Depositor
Recommended contour level	0.5	Depositor
Map size ( $\text{\AA}$ )	316.8, 316.8, 316.8	wwPDB
Map dimensions	384, 384, 384	wwPDB
Map angles ( $^\circ$ )	90.0, 90.0, 90.0	wwPDB
Pixel spacing ( $\text{\AA}$ )	0.825, 0.825, 0.825	Depositor

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: MOV

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	0.49	0/2296	0.63	0/3117
2	B	0.31	0/851	0.45	0/1152
3	C	0.67	0/59	1.00	0/78
4	D	0.38	0/819	0.59	0/1109
5	E	0.57	0/896	0.71	0/1216
All	All	0.47	0/4921	0.62	0/6672

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	2235	0	2085	51	0
2	B	828	0	791	14	0
3	C	60	0	66	6	0
4	D	803	0	797	18	0
5	E	876	0	835	22	0
6	E	41	0	0	0	0
All	All	4843	0	4574	104	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 (104) 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:D:47:LEU:HA	4:D:58:VAL:HG21	1.61	0.81
5:E:6:GLU:OE1	5:E:109:GLY:HA3	1.91	0.69
5:E:86:LEU:HD23	5:E:116:VAL:HG22	1.77	0.66
4:D:5:THR:HG23	4:D:24:ARG:HD3	1.82	0.60
1:A:195:SER:HB2	1:A:198:GLU:HB2	1.84	0.59
4:D:37:GLN:HB2	4:D:47:LEU:HD11	1.83	0.59
1:A:99:TYR:HA	1:A:113:TYR:O	2.03	0.59
1:A:13:SER:HB3	1:A:78:LEU:HD13	1.83	0.58
1:A:84:TYR:HB3	1:A:139:ALA:HB1	1.83	0.58
1:A:234:ARG:NH2	1:A:242:GLN:OE1	2.35	0.58
2:B:60:LEU:HD11	2:B:101:ARG:HB2	1.85	0.57
4:D:33:VAL:HG22	4:D:90:GLN:HG2	1.85	0.57
5:E:75:SER:O	5:E:76:LYS:HB2	2.03	0.57
5:E:29:PHE:HZ	5:E:79:ALA:HB2	1.69	0.56
5:E:51:ILE:HG12	5:E:72:ALA:HB2	1.86	0.56
1:A:211:ALA:HB1	1:A:233:THR:HG21	1.88	0.56
1:A:208:PHE:HE1	1:A:211:ALA:HA	1.71	0.56
1:A:114:ARG:HH21	1:A:114:ARG:HG3	1.70	0.56
1:A:172:LEU:HB3	1:A:180:GLN:HE21	1.70	0.55
4:D:7:SER:HB3	4:D:8:PRO:HD3	1.86	0.55
1:A:44:ARG:NH1	1:A:61:ASP:OD1	2.40	0.54
1:A:20:PRO:HG2	1:A:75:ARG:HG2	1.89	0.54
2:B:27:ILE:HG12	2:B:102:VAL:HG21	1.91	0.53
5:E:11:LEU:HD13	5:E:115:THR:HB	1.90	0.53
1:A:108:ARG:CZ	4:D:66:ARG:HD2	2.39	0.53
2:B:43:LEU:HB2	2:B:90:PHE:CD1	2.44	0.53
4:D:66:ARG:NH1	4:D:68:GLY:O	2.41	0.53
3:C:12:CYS:SG	3:C:12:CYS:O	2.66	0.53
4:D:4:MET:HE3	4:D:90:GLN:HB2	1.90	0.53
1:A:27:TYR:HE2	2:B:75:SER:HG	1.57	0.52
4:D:14:SER:OG	4:D:15:VAL:N	2.43	0.52
5:E:83:MET:HE2	5:E:86:LEU:HD11	1.92	0.52
2:B:93:THR:HG23	2:B:96:ASP:H	1.74	0.52
1:A:101:CYS:SG	1:A:164:CYS:O	2.68	0.52
1:A:43:GLN:O	1:A:44:ARG:HG2	2.10	0.51
2:B:59:LEU:HD23	2:B:69:VAL:HG21	1.91	0.51
5:E:54:SER:O	5:E:55:SER:OG	2.23	0.51
2:B:61:LYS:HB3	2:B:66:ILE:HD11	1.92	0.51

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:67:VAL:CG2	3:C:8:VAL:HG11	2.41	0.50
1:A:187:THR:HB	1:A:272:LEU:HD21	1.94	0.50
5:E:39:GLN:HB2	5:E:45:LEU:HD23	1.94	0.49
2:B:44:ASN:HB3	2:B:85:LEU:HD11	1.93	0.49
5:E:29:PHE:HB2	5:E:77:ASN:ND2	2.27	0.49
1:A:146:LYS:HG3	3:C:14:VAL:HG21	1.95	0.49
1:A:215:LEU:HD12	1:A:243:LYS:HE3	1.94	0.49
5:E:7:SER:HA	5:E:112:THR:HG21	1.94	0.49
1:A:81:LEU:HD12	1:A:95:ILE:HD11	1.95	0.49
1:A:22:PHE:CE2	1:A:24:ALA:HB2	2.48	0.48
2:B:43:LEU:HB2	2:B:90:PHE:CE1	2.49	0.48
1:A:44:ARG:HA	1:A:64:THR:HG23	1.94	0.48
1:A:3:HIS:CG	1:A:172:LEU:HD21	2.48	0.48
1:A:123:TYR:CZ	1:A:140:ALA:HA	2.49	0.48
1:A:219:ARG:HE	1:A:256:ARG:HE	1.61	0.48
1:A:109:PHE:HB2	1:A:165:VAL:HG21	1.95	0.48
1:A:95:ILE:HA	1:A:117:ALA:O	2.12	0.47
5:E:4:LEU:HB3	5:E:96:CYS:SG	2.54	0.47
1:A:33:PHE:CD2	1:A:34:VAL:HG13	2.50	0.47
4:D:30:SER:HB3	4:D:66:ARG:HD3	1.96	0.47
5:E:75:SER:C	5:E:77:ASN:H	2.18	0.47
1:A:78:LEU:CD2	1:A:95:ILE:HG13	2.45	0.47
2:B:27:ILE:HD13	2:B:111:LYS:HD2	1.95	0.47
1:A:219:ARG:HG2	1:A:220:ASP:H	1.81	0.46
4:D:64:GLY:HA2	4:D:72:THR:O	2.16	0.46
4:D:11:LEU:O	4:D:11:LEU:HD23	2.16	0.46
1:A:188:HIS:O	1:A:204:TRP:HB2	2.16	0.46
1:A:129:ASP:HB3	1:A:131:ARG:HG2	1.98	0.45
1:A:114:ARG:HH21	1:A:114:ARG:CG	2.30	0.45
3:C:11:ALA:O	3:C:12:CYS:C	2.54	0.45
1:A:85:TYR:HH	1:A:123:TYR:HD2	1.64	0.45
1:A:96:GLN:C	1:A:97:ILE:HG13	2.37	0.45
1:A:208:PHE:CE1	1:A:211:ALA:HA	2.52	0.44
5:E:12:VAL:HG11	5:E:86:LEU:CD2	2.46	0.44
4:D:59:PRO:HG3	4:D:61:ARG:NH2	2.32	0.44
4:D:39:LYS:HG2	4:D:84:ALA:HB2	1.98	0.44
2:B:79:ASP:OD1	2:B:79:ASP:N	2.50	0.44
4:D:58:VAL:CG1	4:D:62:PHE:CD1	3.00	0.44
4:D:37:GLN:HG3	4:D:86:TYR:CE1	2.53	0.43
2:B:90:PHE:HE2	2:B:92:PRO:HB3	1.82	0.43
4:D:54:LEU:HD11	4:D:62:PHE:O	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:147:TRP:CZ2	3:C:16:LYS:HD3	2.54	0.43
1:A:166:GLU:O	1:A:166:GLU:HG3	2.16	0.43
1:A:215:LEU:HD23	1:A:261:VAL:HG12	2.01	0.43
5:E:86:LEU:HD23	5:E:116:VAL:CG2	2.48	0.43
5:E:20:LEU:HD21	5:E:114:VAL:CG2	2.49	0.43
1:A:9:TYR:CE1	1:A:24:ALA:HB1	2.54	0.42
1:A:165:VAL:HG12	1:A:165:VAL:O	2.19	0.42
1:A:186:LYS:HB3	1:A:186:LYS:HE3	1.68	0.42
1:A:28:VAL:HG11	1:A:179:LEU:HD13	2.01	0.42
4:D:24:ARG:HG3	4:D:70:ASP:OD1	2.19	0.42
5:E:6:GLU:OE1	5:E:6:GLU:N	2.53	0.41
1:A:65:ARG:HH12	5:E:55:SER:HB2	1.85	0.41
1:A:21:ARG:NH2	1:A:37:ASP:OD2	2.53	0.41
1:A:217:TRP:HZ3	1:A:257:TYR:HB3	1.85	0.41
2:B:49:GLY:HA2	2:B:81:SER:HB2	2.02	0.41
5:E:33:SER:N	5:E:99:GLY:O	2.53	0.41
5:E:67:ARG:NH1	5:E:85:SER:O	2.52	0.41
2:B:111:LYS:HB2	2:B:111:LYS:HE3	1.78	0.41
1:A:6:ARG:NH2	1:A:113:TYR:CE2	2.89	0.41
1:A:137:ASP:HB3	1:A:140:ALA:HB2	2.03	0.41
5:E:91:THR:HA	5:E:114:VAL:O	2.21	0.41
1:A:6:ARG:HD2	1:A:98:MET:SD	2.61	0.40
1:A:67:VAL:HG22	3:C:8:VAL:HG11	2.03	0.40
1:A:95:ILE:HG12	1:A:118:TYR:CD1	2.57	0.40
5:E:1:GLU:HB3	5:E:2:VAL:H	1.54	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	272/274 (99%)	246 (90%)	26 (10%)	0	<a href="#">100</a> <a href="#">100</a>

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
2	B	97/100 (97%)	97 (100%)	0	0	100	100
3	C	8/10 (80%)	7 (88%)	1 (12%)	0	100	100
4	D	104/216 (48%)	88 (85%)	16 (15%)	0	100	100
5	E	115/228 (50%)	101 (88%)	14 (12%)	0	100	100
All	All	596/828 (72%)	539 (90%)	57 (10%)	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	231/231 (100%)	229 (99%)	2 (1%)	75	84
2	B	94/94 (100%)	94 (100%)	0	100	100
3	C	6/6 (100%)	5 (83%)	1 (17%)	2	8
4	D	91/190 (48%)	91 (100%)	0	100	100
5	E	91/189 (48%)	86 (94%)	5 (6%)	18	44
All	All	513/710 (72%)	505 (98%)	8 (2%)	58	74

All (8) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	29	ASP
1	A	116	ASP
3	C	14	VAL
5	E	3	GLN
5	E	12	VAL
5	E	25	SER
5	E	77	ASN
5	E	87	ARG

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

Mol	Chain	Res	Type
1	A	180	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

1 ligand is 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$
6	MOV	E	301	3	43,45,45	0.63	0	53,67,67	0.93	3 (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
6	MOV	E	301	3	-	11/20/35/35	0/5/5/5

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	E	301	MOV	C17-C18-N6	2.35	115.08	110.42
6	E	301	MOV	C17-N2-C7	2.04	125.55	119.40
6	E	301	MOV	C18-N6-C19	2.03	116.98	113.07

There are no chirality outliers.

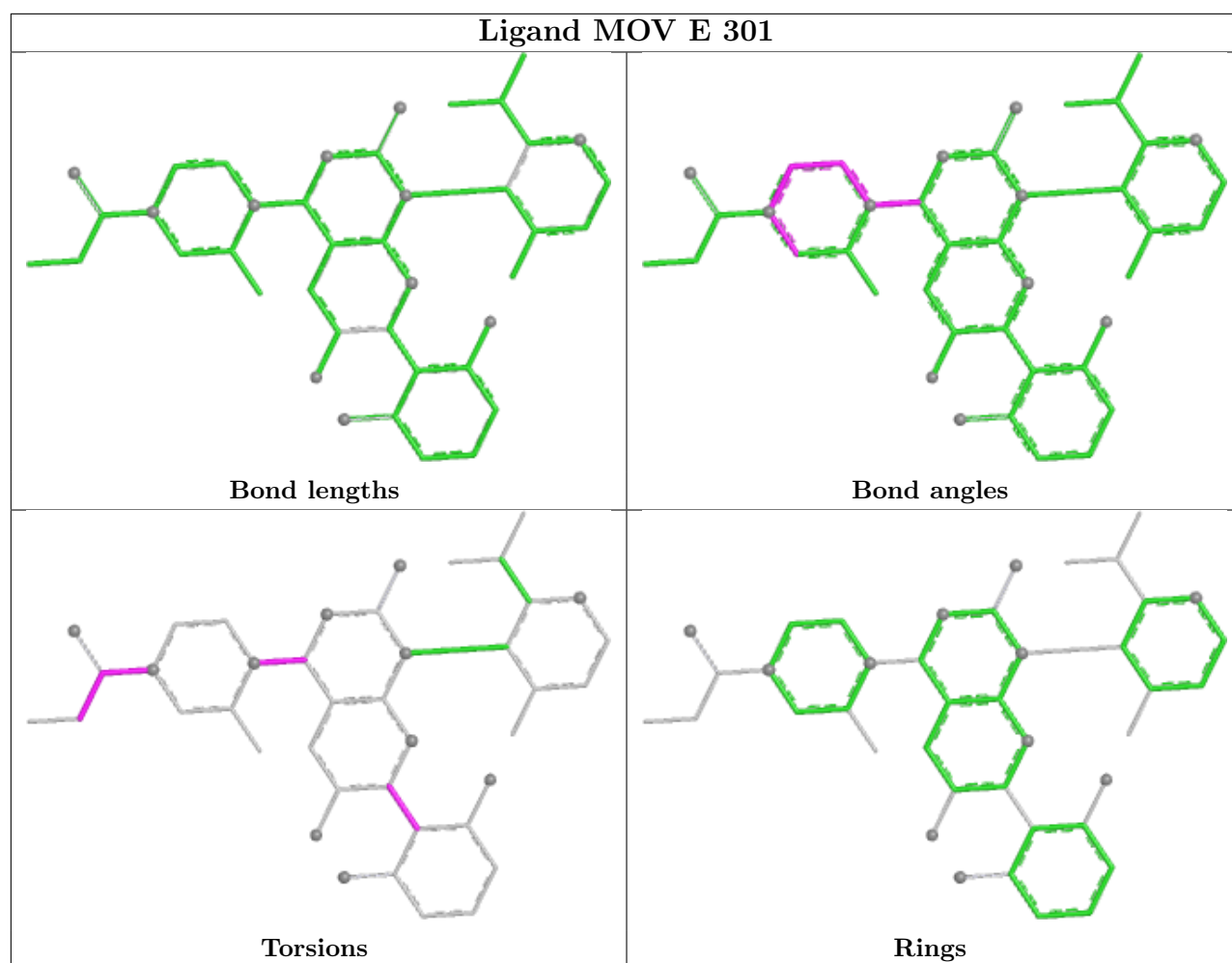
All (11) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
6	E	301	MOV	O2-C23-N6-C19
6	E	301	MOV	C24-C23-N6-C19
6	E	301	MOV	O2-C23-N6-C18
6	E	301	MOV	C24-C23-N6-C18
6	E	301	MOV	N6-C23-C24-C25
6	E	301	MOV	N3-C7-N2-C17
6	E	301	MOV	C1-C7-N2-C17
6	E	301	MOV	N1-C3-C6-C26
6	E	301	MOV	O2-C23-C24-C25
6	E	301	MOV	C4-C3-C6-C26
6	E	301	MOV	C4-C3-C6-C30

There are no ring outliers.

No monomer is involved in short contacts.

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



## 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.

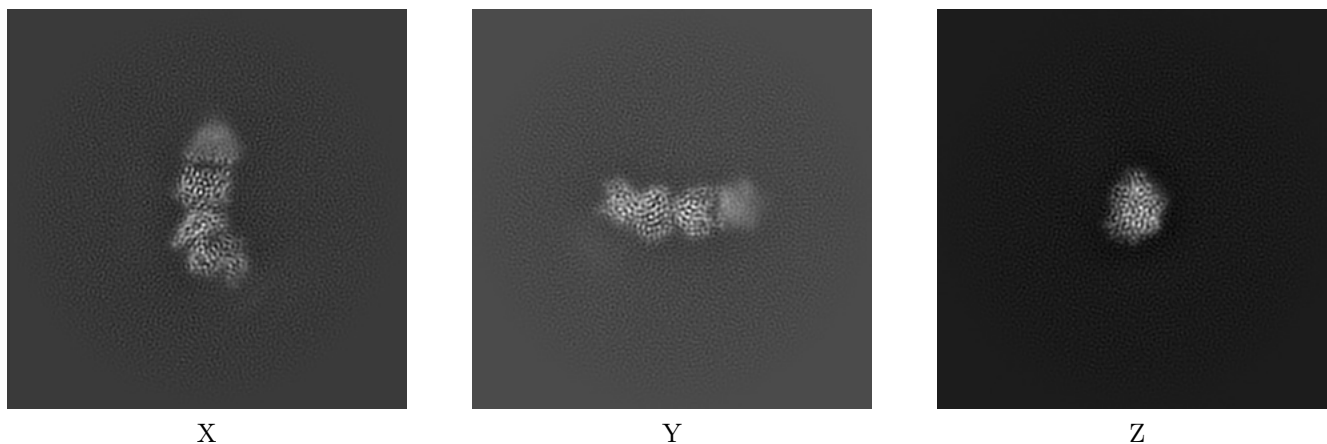
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-43480. These allow visual inspection of the internal detail of the map and identification of artifacts.

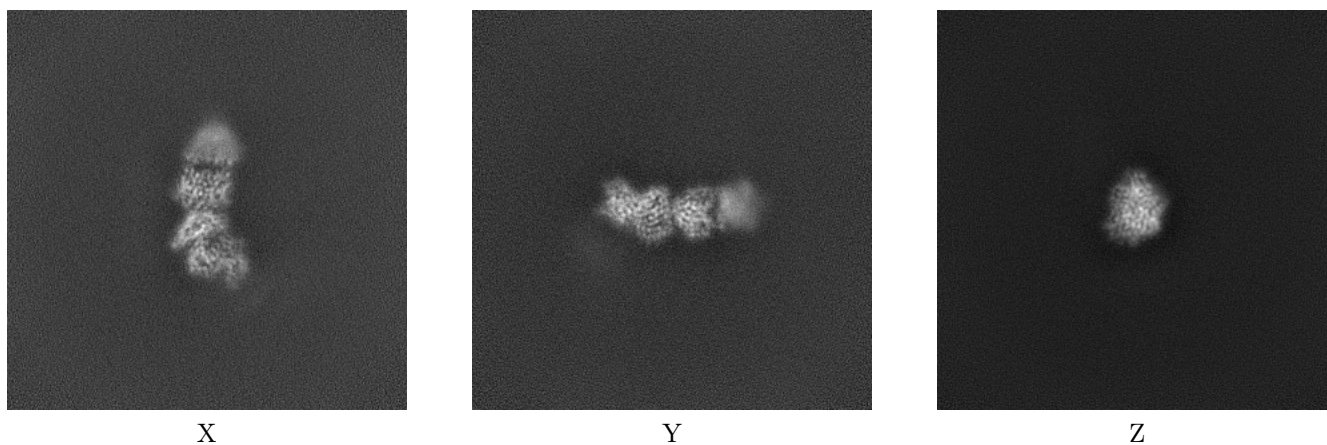
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

#### 6.1.1 Primary map



#### 6.1.2 Raw map

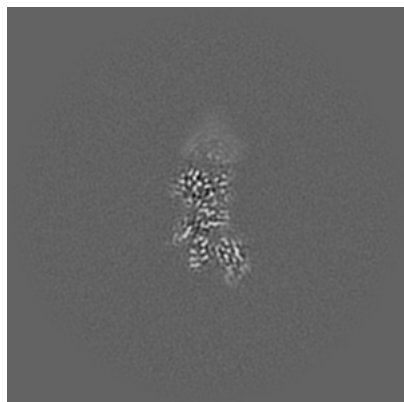


The images above show the map projected in three orthogonal directions.

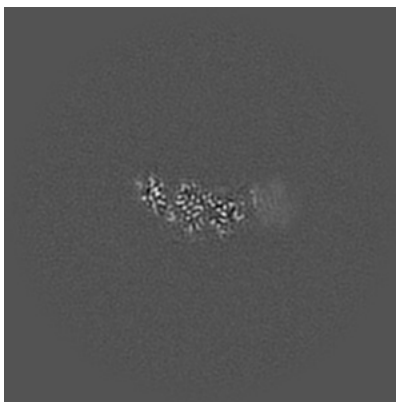


## 6.2 Central slices [i](#)

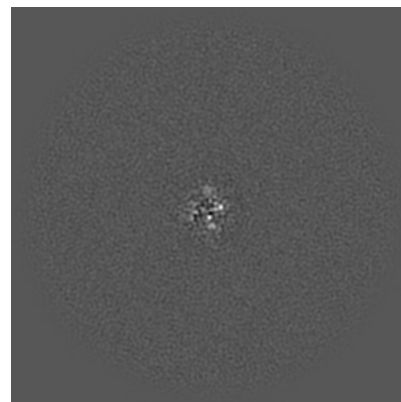
### 6.2.1 Primary map



X Index: 192

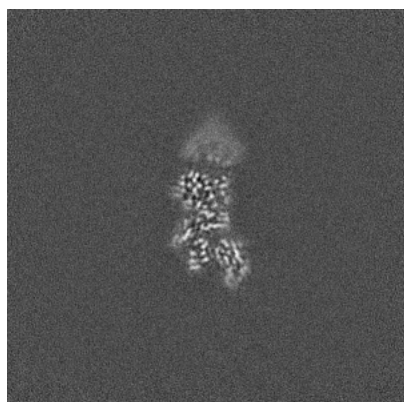


Y Index: 192

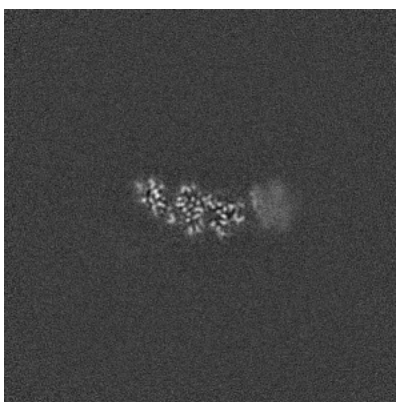


Z Index: 192

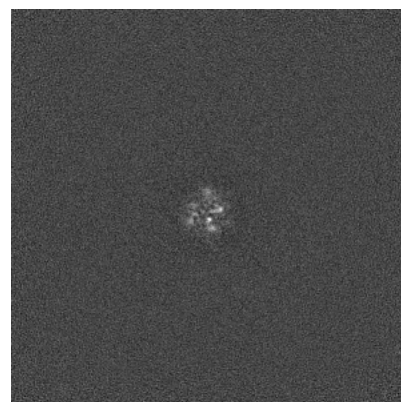
### 6.2.2 Raw map



X Index: 192



Y Index: 192

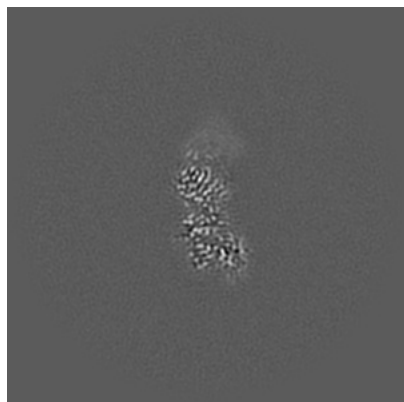


Z Index: 192

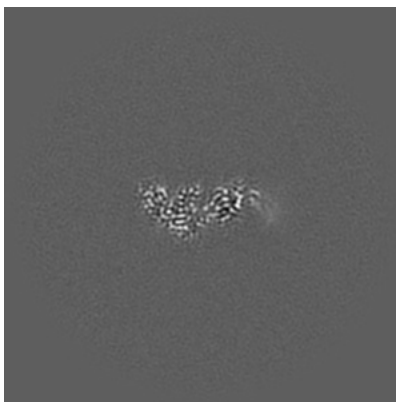
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

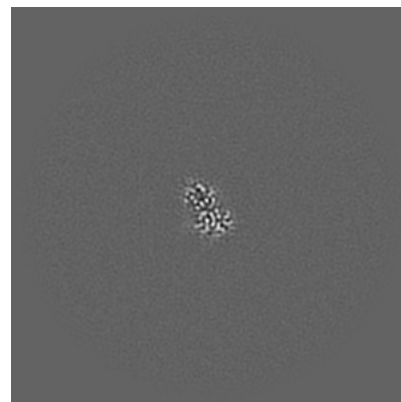
### 6.3.1 Primary map



X Index: 195

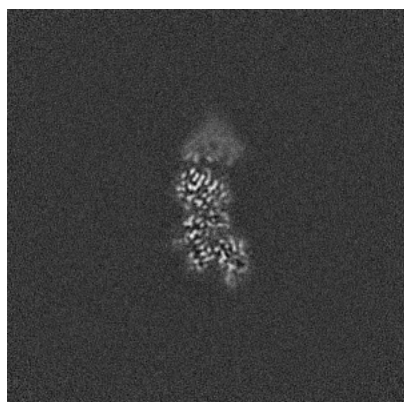


Y Index: 182

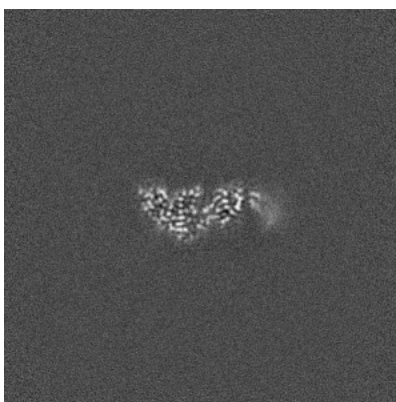


Z Index: 213

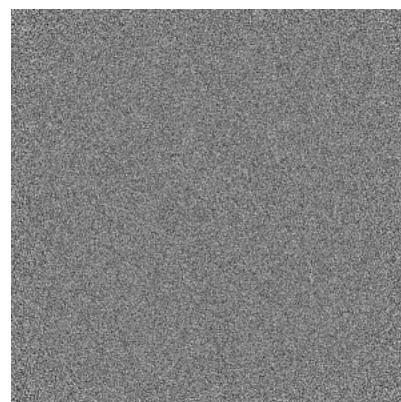
### 6.3.2 Raw map



X Index: 194



Y Index: 182

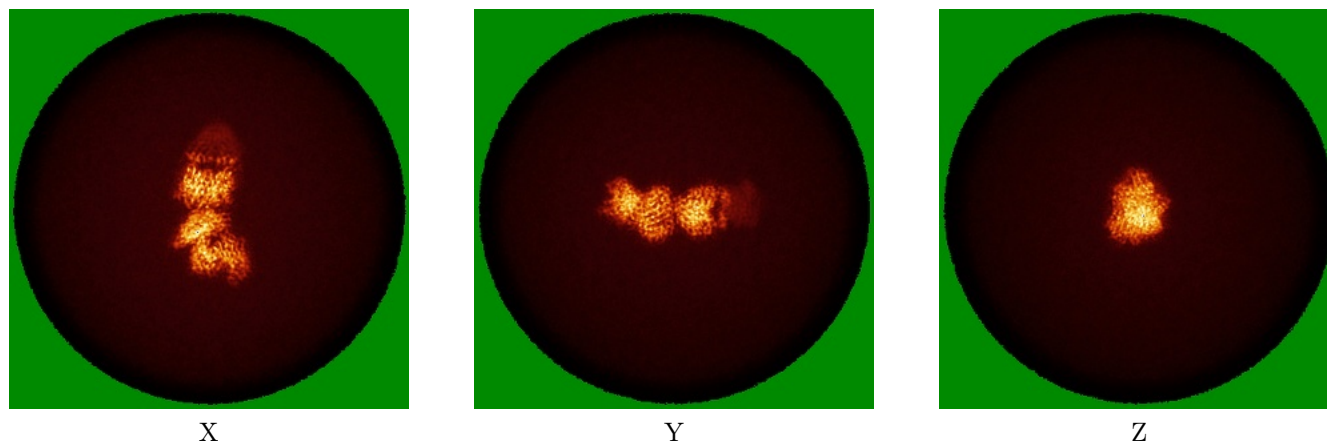


Z Index: 0

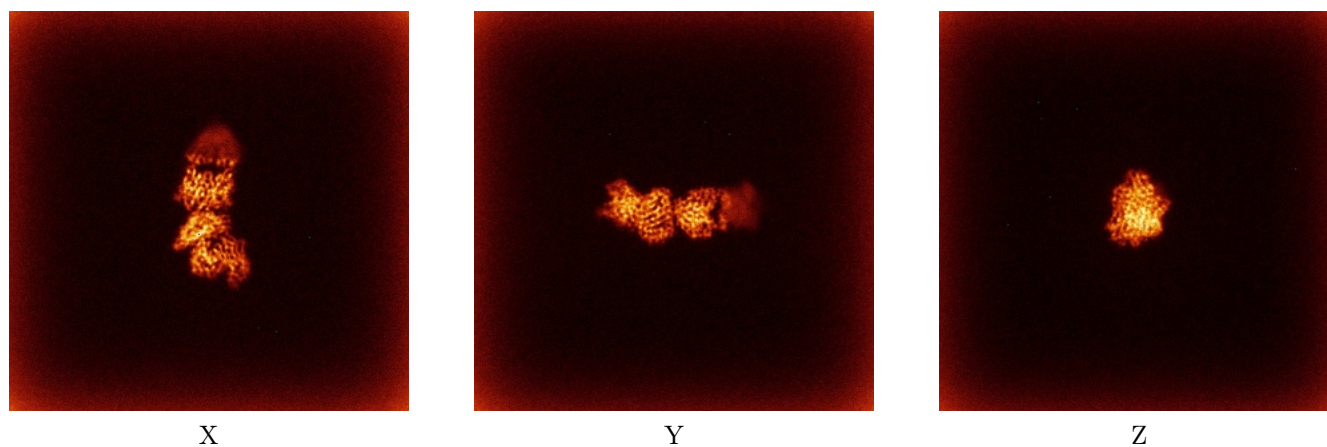
The images above show the largest variance slices of the map in three orthogonal directions.

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

### 6.4.1 Primary map



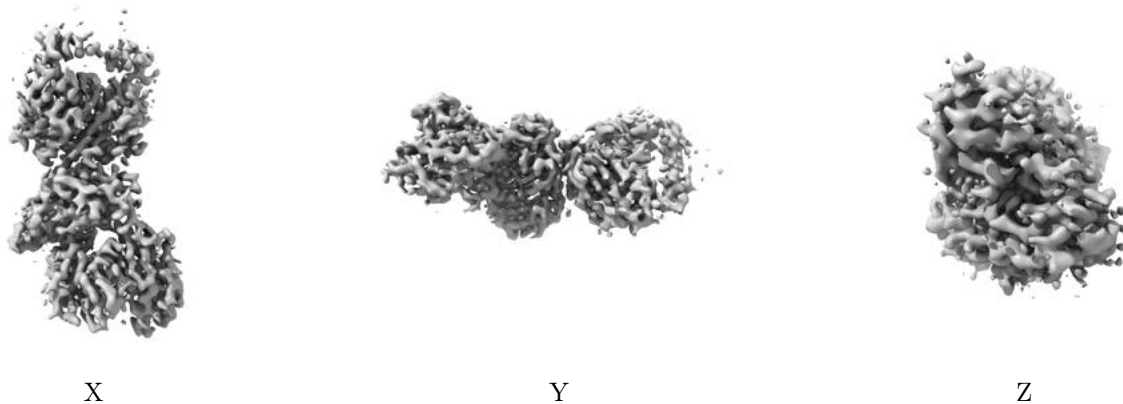
### 6.4.2 Raw map



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

## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.5. 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



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.

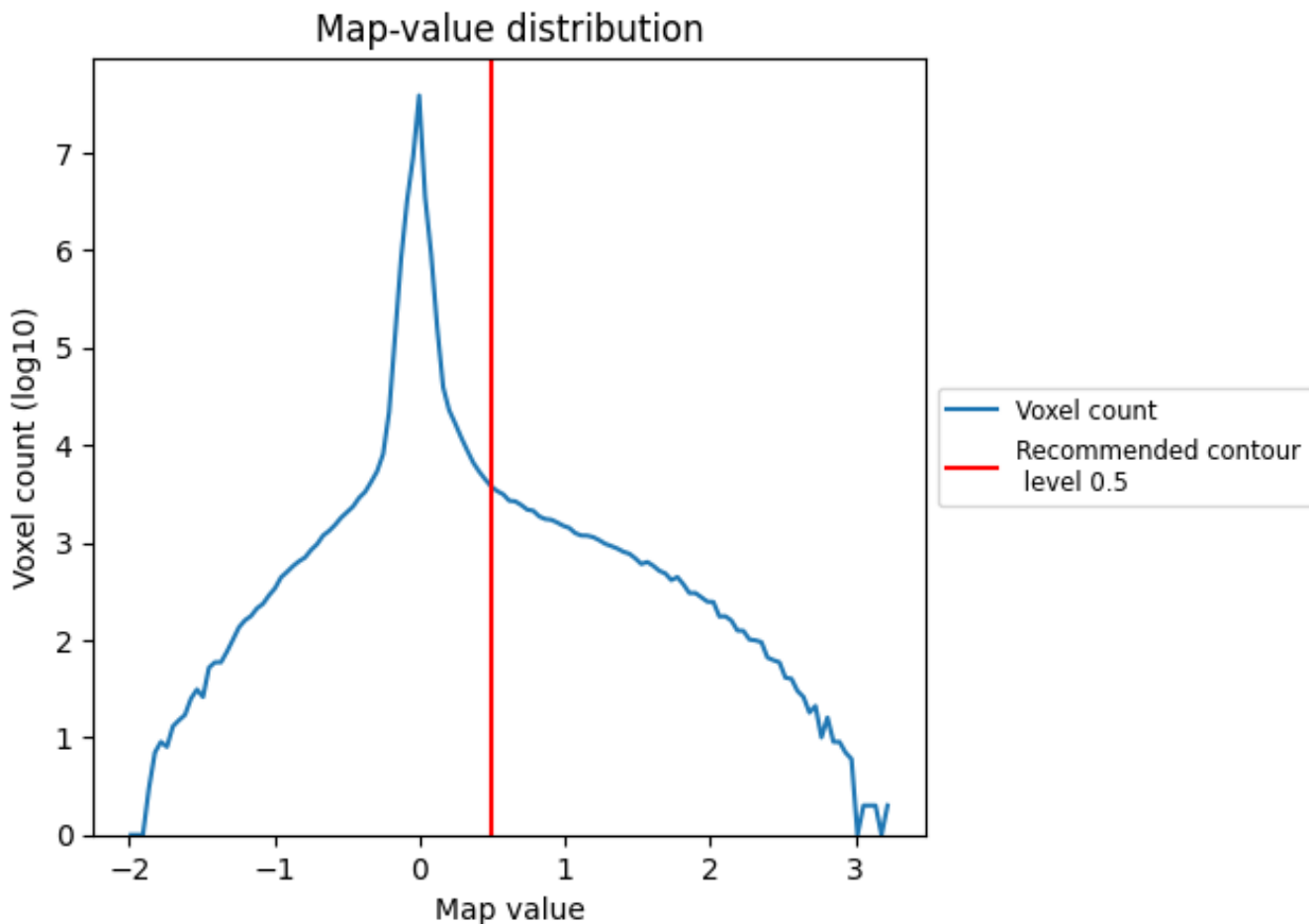
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

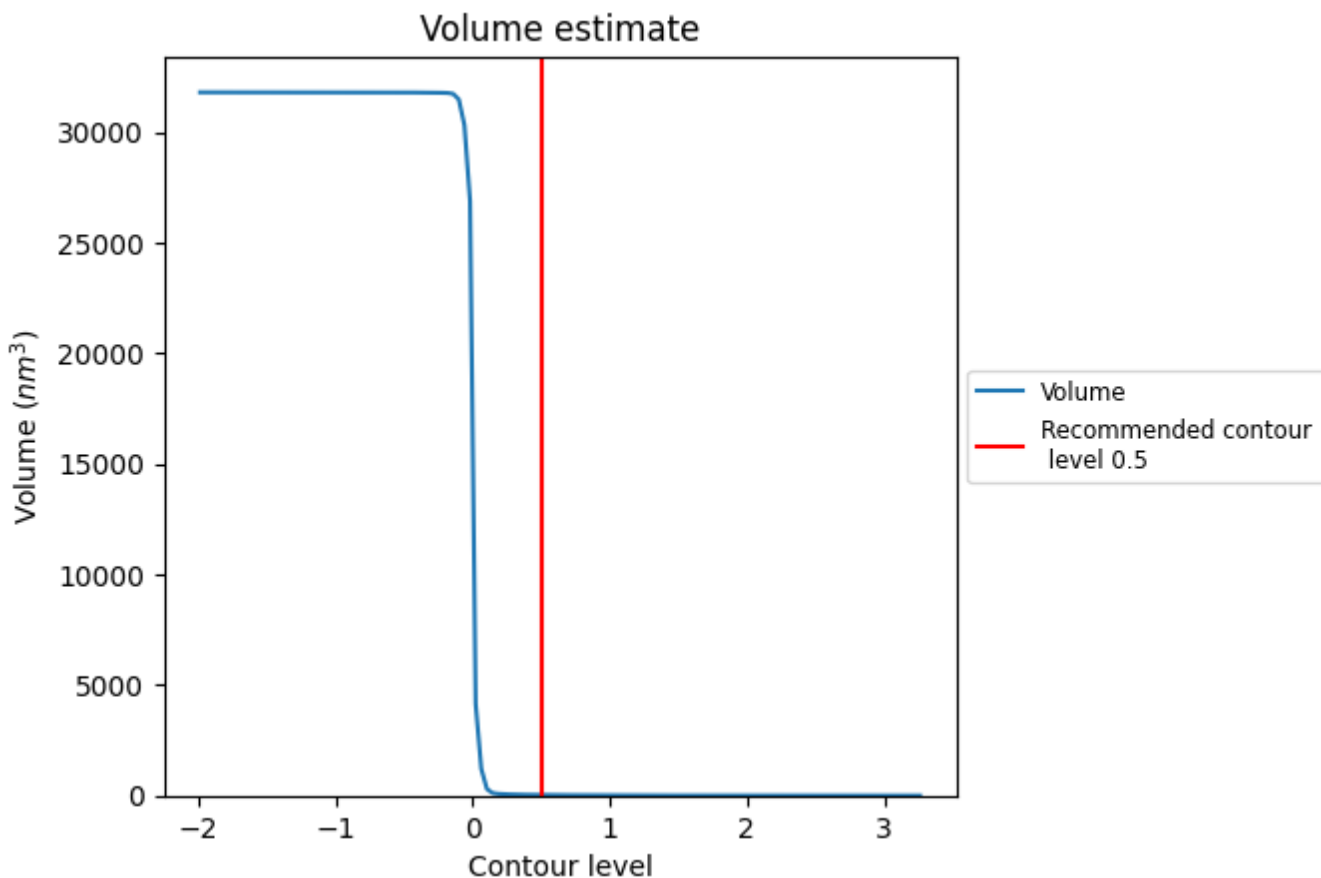
This section contains the results of statistical analysis of the map.

### 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.

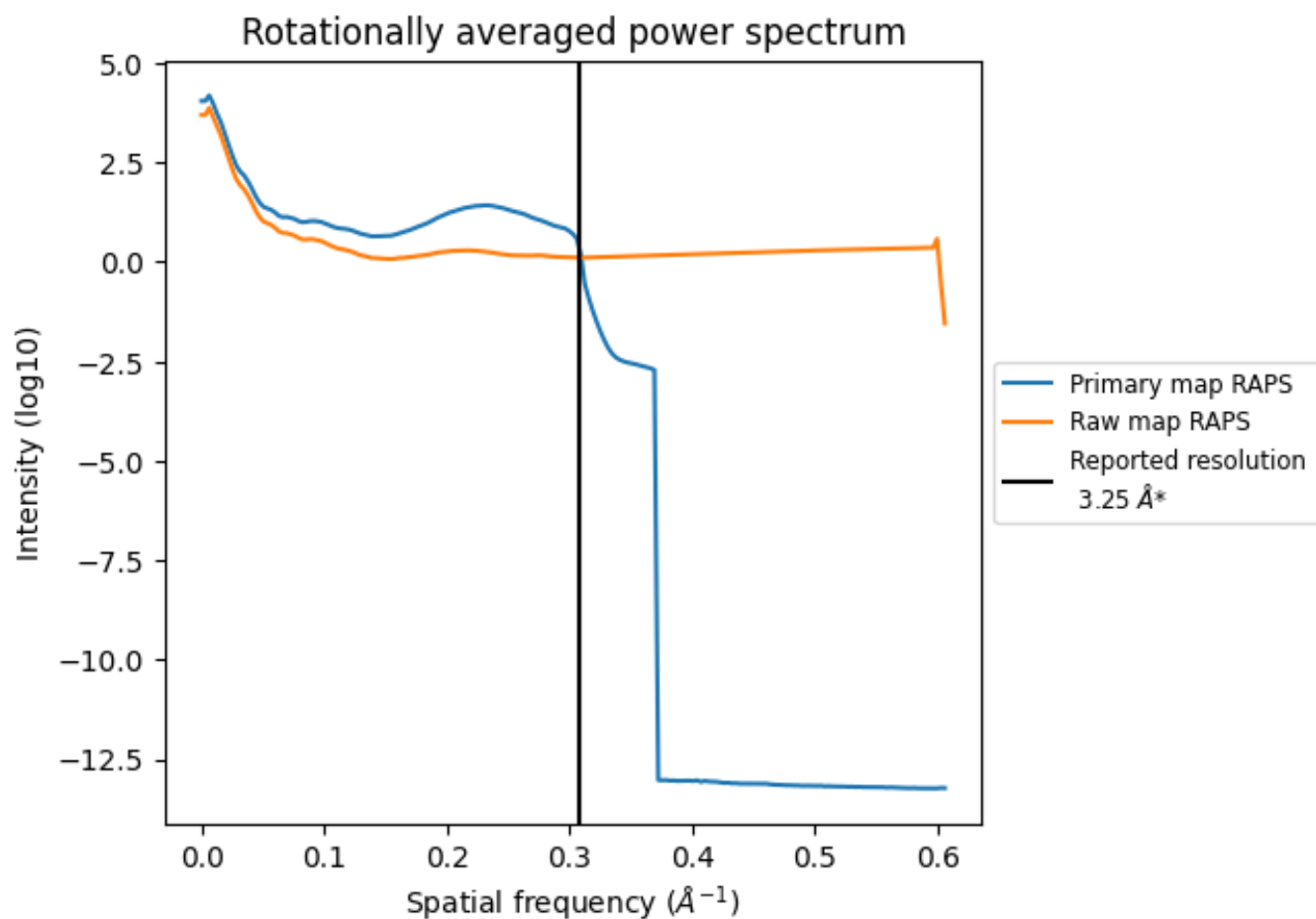
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 28 nm<sup>3</sup>; this corresponds to an approximate mass of 25 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](#)

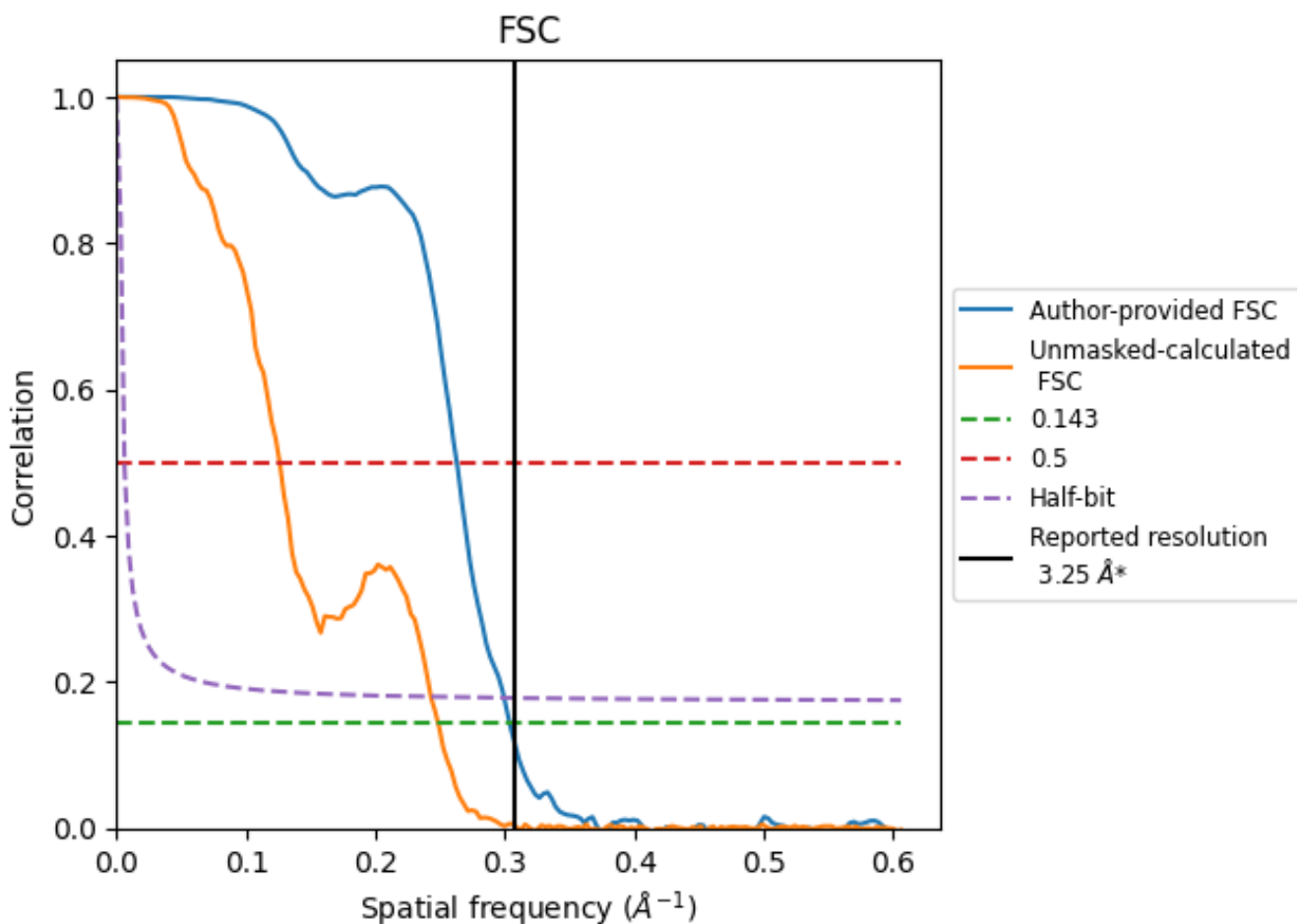


\*Reported resolution corresponds to spatial frequency of 0.308 Å<sup>-1</sup>

## 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 0.308 Å<sup>-1</sup>



## 8.2 Resolution estimates [i](#)

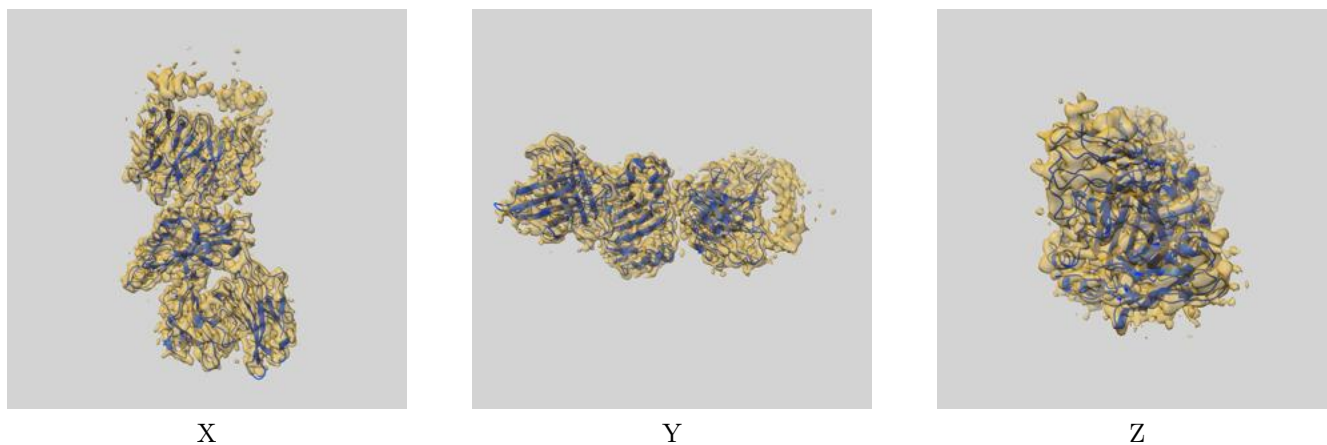
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.25	-	-
Author-provided FSC curve	3.29	3.80	3.34
Unmasked-calculated*	4.02	7.93	4.12

\*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 4.02 differs from the reported value 3.25 by more than 10 %

## 9 Map-model fit [i](#)

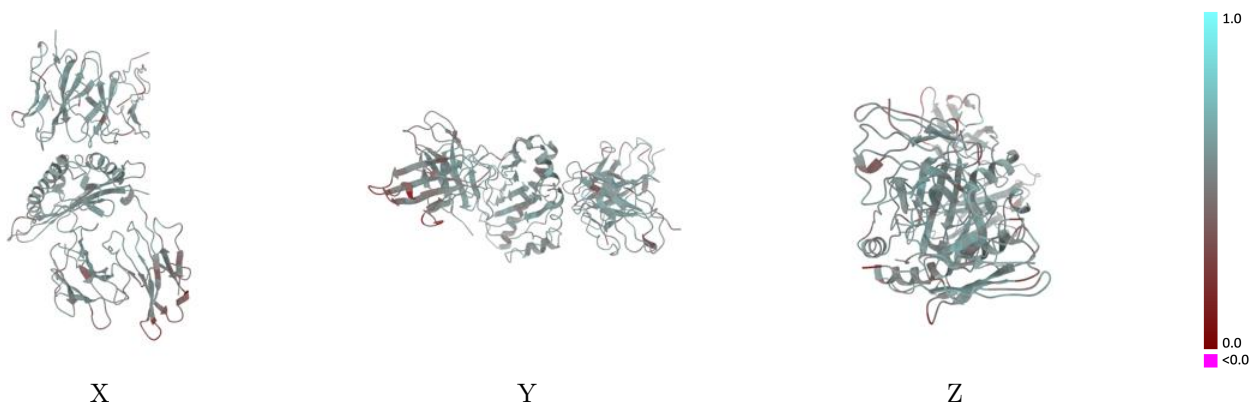
This section contains information regarding the fit between EMDB map EMD-43480 and PDB model 8VRB. Per-residue inclusion information can be found in section 3 on page 5.

### 9.1 Map-model overlay [i](#)



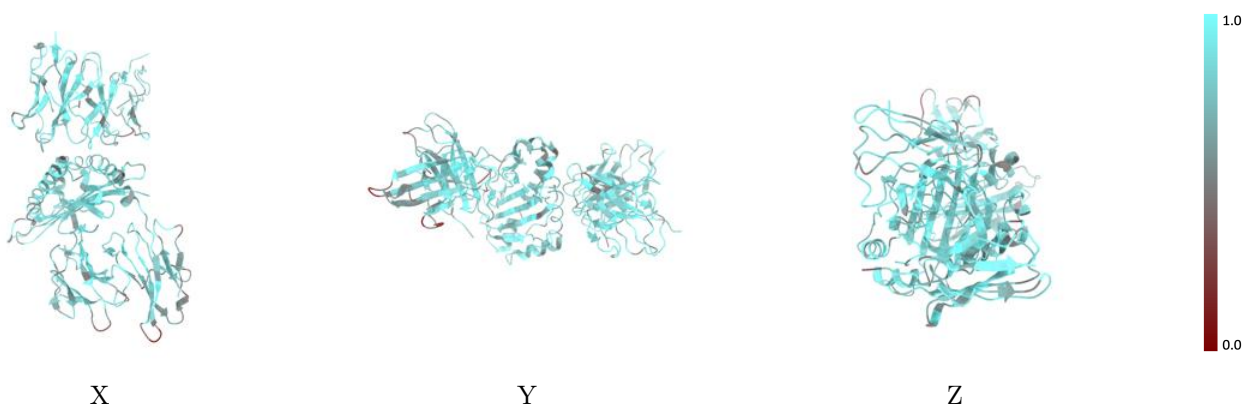
The images above show the 3D surface view of the map at the recommended contour level 0.5 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



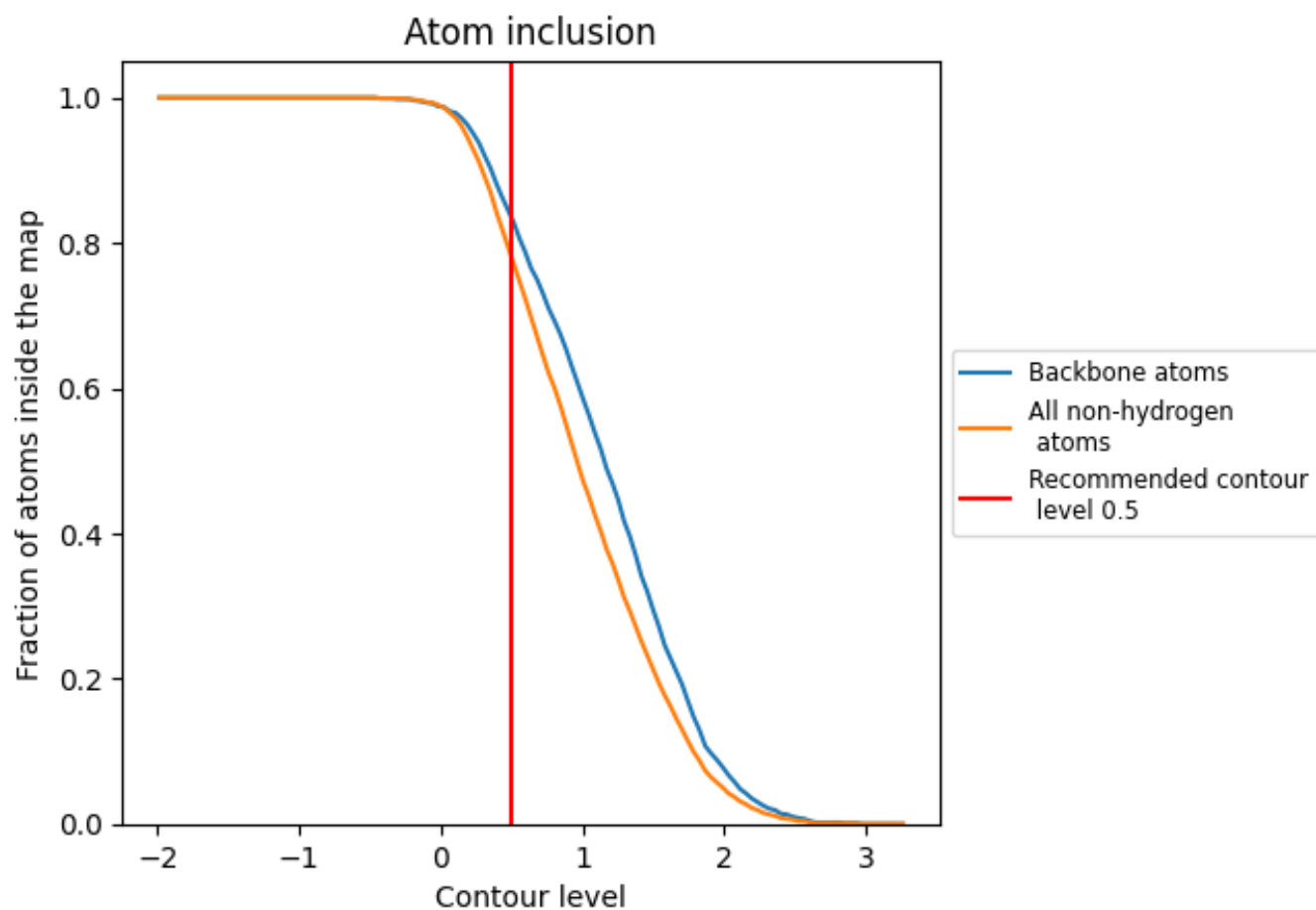
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

## 9.3 Atom inclusion mapped to coordinate model [\(i\)](#)



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













## 9.4 Atom inclusion [i](#)



At the recommended contour level, 83% of all backbone atoms, 78% 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	 0.7790	 0.5160
A	 0.7660	 0.5060
B	 0.7640	 0.5200
C	 0.7330	 0.5210
D	 0.7870	 0.5240
E	 0.8190	 0.5290

