WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB EM Validation Report ⓘ

Dec 15, 2025 – 09:15 PM JST

PDB ID	:	9V0J / pdb_00009v0j
EMDB ID	:	EMD-64665
Title	:	Cryo-EM structure of GATOR1-KICSTOR complex
Authors	:	Su, M.-Y.
Deposited on	:	2025-05-18
Resolution	:	2.97 Å(reported)

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

EMDB validation analysis	:	0.0.1.dev129
MolProbity	:	4-5-2 with Phenix2.0
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
EM percentile statistics	:	202505.v01 (Using data in the EMDB archive up until May 2025)
MapQ	:	1.9.13
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.47

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 2.97 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		9
Ramachandran outliers		0.5%
Sidechain outliers		4.9%

Worse   *Better*

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

Metric	Model-Map Fit Percentile Ranks	Value
Q-score		0.47

Worse   *Better*

▮ Percentile relative to all EM structures
▯ Percentile relative to EM structures of similar resolution
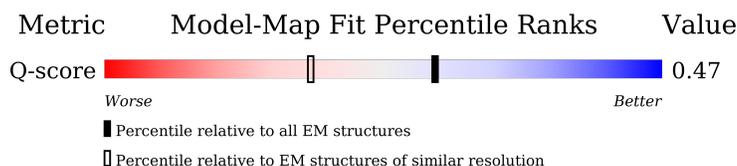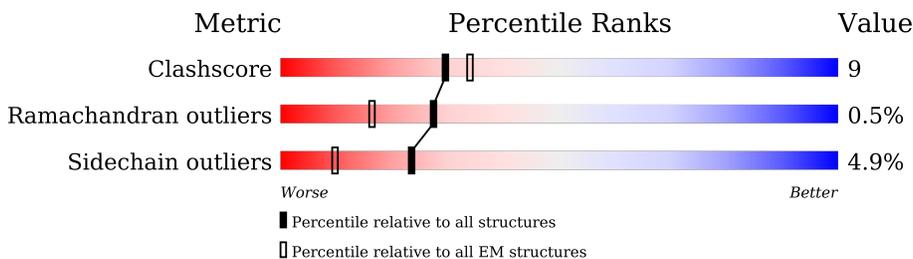
Metric	Whole archive (#Entries)	EM structures (#Entries)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	13205 (2.47 - 3.47)

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	380	73% 21% • •
2	B	569	51% 20% • 28%
3	C	1603	49% 10% • 40%
4	D	3432	7% • 91%

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2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 14747 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 GATOR1 complex protein NPRL2.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	363	Total	C	N	O	S	0	0
			2716	1770	461	469	16		

- Molecule 2 is a protein called GATOR1 complex protein NPRL3.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	408	Total	C	N	O	S	0	0
			3045	1985	533	513	14		

- Molecule 3 is a protein called GATOR1 complex protein DEPDC5.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	960	Total	C	N	O	S	0	0
			6981	4543	1189	1219	30		

- Molecule 4 is a protein called KICSTOR complex protein SZT2.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	292	Total	C	N	O	S	0	0
			2005	1296	335	364	10		

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.
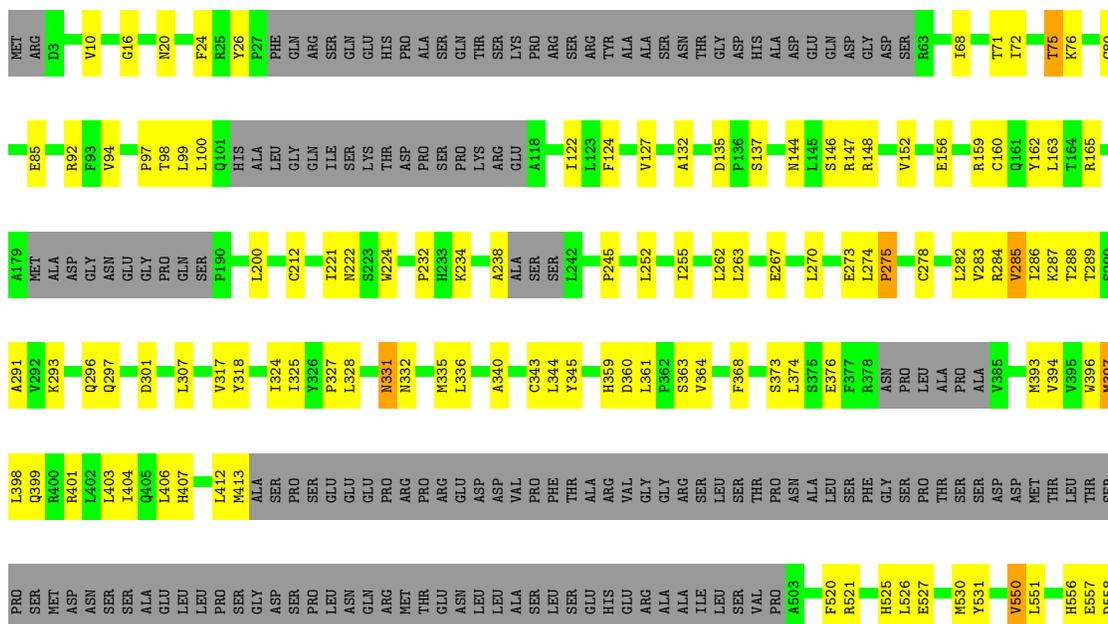
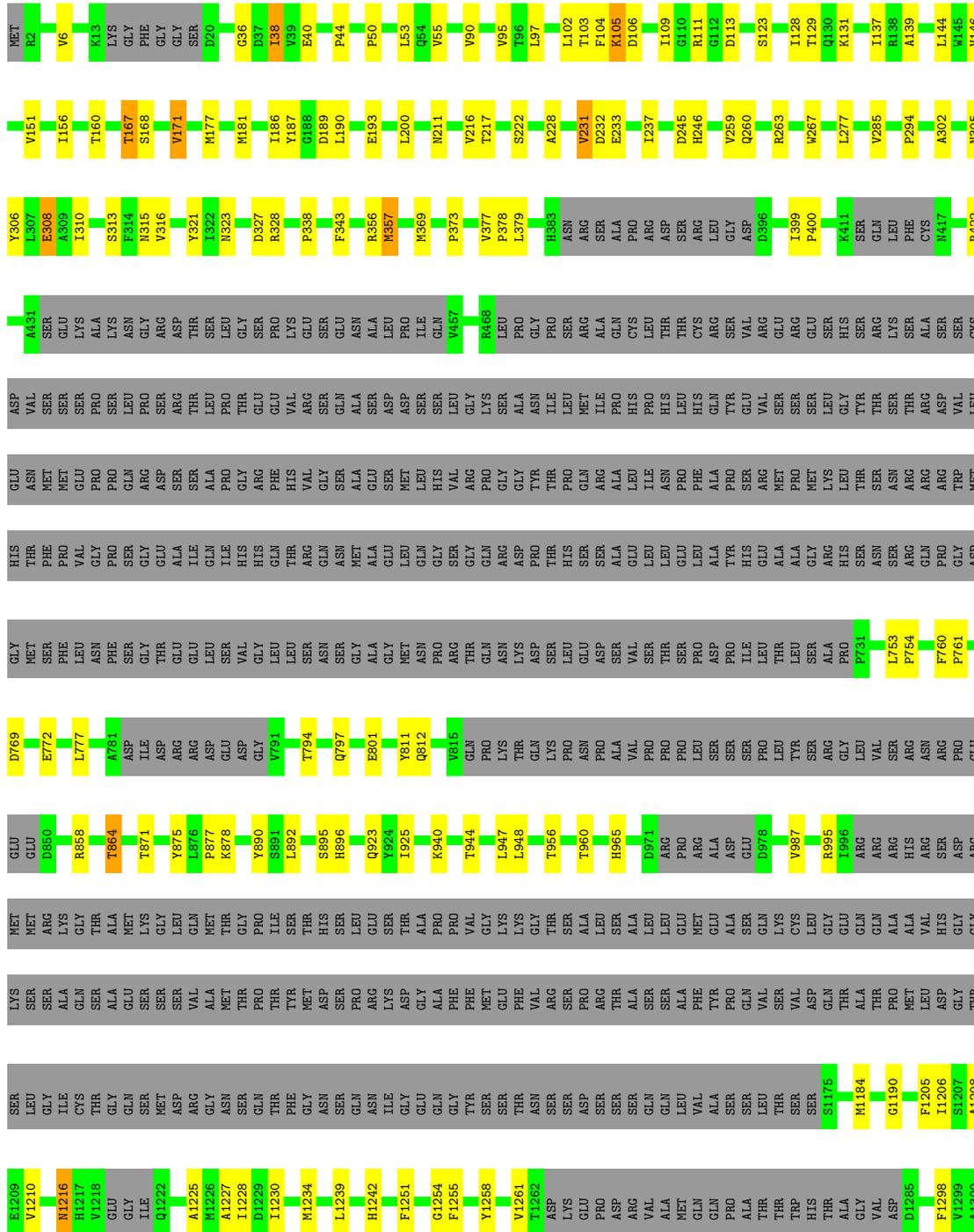- Molecule 1: GATOR1 complex protein NPRL2

Chain A:

- Molecule 2: GATOR1 complex protein NPRL3

Chain B:

I561 Q565 A566 L567 L568 P569

• Molecule 3: GATOR1 complex protein DEPDC5

Chain C:　　　　49%　　　　10%　•　　　40%

MET R2 V6 K13 LYS GLY PHE GLY SER D20 G36 D37 I38 V39 E40 P44 P50 L53 Q54 V55 V90 V95 T96 L97 L102 T103 F104 K105 D106 I109 G110 R111 G112 D113 S123 I128 T129 Q130 K131 I137 R138 A139 L144 W145 V146

V151 I156 T160 T167 S168 V171 M177 M181 I186 Y187 G188 D189 L190 E193 L200 N211 V216 T217 S222 A228 V231 D232 E233 I237 D245 H246 V259 Q260 R263 W267 L277 V285 P294 A302 N305

Y306 L307 E308 A309 I310 S313 F314 N315 V316 Y321 I322 N323 D327 R328 P338 F343 R356 M357 M369 P373 V377 P378 L379 H383 ASN ARG SER ALA PRO ARG ASP SER ARG LEU GLY ASP D396 I399 P400 K411 SER GLN LEU PHE CYS N417 R422

A431 SER GLU LYS ALA LYS ASN GLY ARG ASP THR SER LEU GLY SER PRO LYS GLU SER GLU ASN ALA LEU PRO ILE GLN V457 R468 LEU PRO GLY PRO SER ARG ALA GLN CYS LEU THR CYS ARG SER VAL ARG GLU ARG GLU SER HIS SER ARG LYS SER ALA SER SER CYS

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

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

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

GLY MET SER PHE LEU ASN PHE SER GLY SER GLY THR GLU GLU LEU SER VAL GLY LEU LEU SER ASN SER GLY ALA GLY LEU MET ASN PRO ARG THR GLN ASN LYS ASP SER SER LEU GLU GLU ASP SER PRO ILE LEU LEU SER LEU ALA PRO P731 L753 P754 F760 P761

D769 E772 L777 A781 ASP ILE ASP ARG GLU ASP ASP GLY V791 T794 Q797 E801 Y811 Q812 V815 GLN PRO LYS THR GLN LYS PRO ASN PRO ALA VAL PRO PRO LEU SER SER PRO LEU TYR SER ARG GLY LEU VAL SER ARG ASN ARG PRO GLU

GLU GLU D850 R858 T864 T871 Y875 L876 P877 K878 Y890 S891 L892 S895 H896 Q923 Y924 I925 K940 T944 L947 L948 T956 T960 H965 D971 ARG PRO ARG ALA ASP GLU D978 V987 R995 I996 ARG ARG HIS ARG SER ASP ARG

MET MET ARG LYS GLY THR ALA MET LYS GLY LEU GLN MET THR GLY PRO ILE SER THR HIS LEU GLU GLY SER THR ALA PRO VAL GLY LYS LYS GLY THR SER ALA LEU SER ALA LEU LEU GLU MET GLU ALA SER GLN LYS CYS LEU GLY GLU GLN ALA ALA VAL HIS GLY GLY

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

SER LEU GLY ILE CYS THR GLN SER SER MET ASP ARG GLY ASN SER GLN THR PHE GLY ASN SER GLN ASN ILE GLY GLU GLY GLY TYR SER SER THR ASN SER SER ASP SER SER SER GLN GLN LEU VAL ALA SER SER LEU THR SER S1175 M1184 G1190 F1205 I1206 S1207 A1208

E1209 V1210 N1216 H1217 V1218 GLU GLY ILE Q1222 A1225 M1226 A1227 I1228 D1229 I1230 M1234 L1239 H1242 F1251 G1254 F1255 Y1258 V1261 T1262 ASP LYS GLU PRO ASP ARG VAL ALA MET GLN GLN PRO ALA THR THR TRP HIS THR ALA GLY VAL ASP D1285 F1298 V1299 A1300

• Molecule 4: KICSTOR complex protein SZT2

Chain D:

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

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

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

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

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

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

PRO LEU SER PRO GLY PRO PHE SER SER MET GLU GLU GLY ALA GLU PRO ARG GLU ALA LEU LEU ALA SER GLU SER ILE GLU GLU THR GLU GLU GLN ASP ALA LEU SER GLU PRO GLU PHE THR ARG VAL PRO GLY ILE ASP PRO GLY PRO GLU ILE LEU ASP VAL CYS

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

LEU GLU PHE SER ALA GLU ALA GLU MET GLY GLU GLY GLY ASP THR SER ALA CYS CYS VAL VAL THR GLU SER PRO LEU GLU GLU VAL TYR ARG GLU ARG GLU GLU ASP ALA GLY PRO ALA GLY LEU ASP SER SER ASP VAL THR VAL ASN PRO ASP GLU

ASP SER PHE SER ILE LEU GLY GLY ASP SER PRO THR GLY PRO GLU SER PHE LEU HIS ASP LEU PRO PRO LEU PHE LEU HIS LEU THR CYS SER VAL ARG GLY LEU GLN HIS HIS ARG SER SER VAL PRO VAL CYS SER LEU PRO THR CYS LEU GLN VAL LEU SER LEU GLU GLU GLY PRO

PRO VAL GLY GLY ARG VAL PRO LEU ARG ASP LEU SER VAL THR LEU ASP VAL PHE MET LEU THR LEU PRO LEU GLU VAL GLU LEU VAL GLY THR ALA SER ASP PRO GLN HIS HIS ARG SER THR GLU GLU SER ALA SER PHE ARG SER SER PRO GLY GLN PRO SER LEU ARG ASP

ASP GLY LEU GLY PRO PRO LEU PRO PRO PRO GLU GLU ARG HIS PRO GLY LEU SER ASN LEU ALA THR PRO HIS ARG LEU ALA ILE GLU THR ALA ASP GLN HIS HIS ARG SER THR GLU GLN PHE LYS GLU PHE ARG ARG LEU HIS PRO GLY GLN PRO GLN SER SER ALA LEU HIS

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

ALA ALA GLY GLN GLN PRO GLY GLY SER HIS GLY GLU PRO SER SER ALA ALA TRP TRP HIS SER HIS GLU ASP ARG ALA GLU GLY ILE GLU GLY GLU THR LEU ALA PRO GLN ALA PRO GLY SER PRO GLU ASP GLU GLY VAL LEU LEU PRO ILE SER LEU ARG VAL PRO

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

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

ILE CYS ARG GLU GLU VAL ASN GLN GLU ARG LEU LEU LEU GLN ASP LEU HIS ASP SER HIS VAL CYS ASN SER LEU VAL ALA GLU GLY SER GLU GLU VAL TYR ALA HIS ALA LEU ALA ARG PRO LEU PRO SER ASP TYR ALA ALA ASP GLU GLU CYS SER ALA PRO

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

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

SER SER ARG SER ASP ALA ALA ARG PRO VAL GLY VAL ASP VAL ASP HIS ILE GLN LEU HIS GLY VAL VAL GLN ALA GLY VAL LEU CYS ARG ARG LEU ASP GLU ILE THR ASP GLU LEU VAL ARG VAL LEU CYS ARG ARG LEU ASP ILE THR VAL MET LEU VAL ARG ASN CYS

Row 1: LYS LEU THR PRO ALA ASP VAL GLU PHE ILE GLN PRO PRO GLY SER LEU PRO SER GLU VAL LEU HIS LEU ALA LEU PRO THR SER CYS ARG PRO TRP PRO ALA LEU ALA TRP TYR LEU ARG GLN ASN LEU ILE PHE HIS SER PRO LYS TYR THR ASP ASN SER ARG ASN

Row 2: HIS PHE GLN HIS PRO LEU PRO PRO GLN GLY GLY LEU PRO ASP LEU ASP ILE TYR LEU LEU ASN LYS PRO GLY GLN GLN GLY THR GLY GLY LYS GLY VAL ALA CYS ILE THR LEU ALA PHE VAL ASP GLU GLY GLY ALA PRO LEU SER LEU ALA LEU TRP PRO PRO SER SER PRO GLY PRO

Row 3: PRO ASP PRO ARG GLU GLU PHE GLU GLN LEU THR GLN VAL ILE ARG CYS PRO VAL VAL VAL ASP SER SER ALA GLN ASN GLY ALA PRO ARG ARG LEU ASP VAL TRP GLU LYS GLY ASN ILE SER ILE VAL GLN GLU GLU LYS LEU ARG GLY GLY ALA ALA ARG GLN ALA

Row 4: LEU ALA ASP ILE ILE LEU GLN LEU PRO ALA SER LEU CYS THR GLU THR PRO THR GLY SER LEU ARG ASN GLY SER LEU GLN THR LYS SER SER ALA GLY ARG ALA SER THR PHE PRO ALA PRO VAL PRO GLU PRO VAL THR PRO PRO SER LYS ALA GLY ARG

Row 5: ARG SER PHE TRP ASP MET LEU SER LYS THR GLU CYS ASP LEU GLY SER PRO LYS THR ASP ASP ILE VAL LEU ASP ARG PRO GLU ASP THR LYS SER ALA GLY ARG ALA SER THR PRO GLY ALA PRO VAL PRO GLU PRO ARG GLY SER ASP GLY ALA GLN

Row 6: ARG GLN LYS ARG ARG THR THR GLN LEU GLU GLU GLY GLY VAL GLY THR LEU HIS PRO VAL PHE ALA ARG VAL ALA GLN TRP MET GLU MET VAL GLN ILE GLY CYS ALA SER VAL SER ARG ASP SER SER HIS MET VAL SER ARG PHE LEU PRO SER ILE LEU SER GLU PHE

Row 7: THR ALA LEU VAL THR SER MET ALA GLY ASP THR SER VAL ARG ILE GLU GLN HIS LEU GLY SER GLU PRO GLU ILE PHE GLY PRO CYS SER PRO GLY LEU GLY VAL VAL ASP LYS LYS LEU GLN LEU LEU GLY ARG ASN PHE LEU GLN TRP ARG ARG PRO

Row 8: THR GLN GLN ALA ALA LYS ALA MET GLN ARG PHE GLU GLY PRO GLY GLY SER GLY ARG ASN ALA PRO ARG GLN ARG LEU LEU GLU VAL ASP LYS LEU LYS GLN LEU LEU THR TYR ASN TRP ALA PRO ASP LEU GLY ALA ALA LEU GLY ARG ALA LEU VAL ARG LEU

Row 9: VAL GLN TRP GLN ASN ALA ARG ALA HIS LEU ILE PHE CYS LEU LEU SER GLN LYS LEU GLY LEU PHE HIS HIS TYR GLY GLN LEU ASP PHE PRO VAL ARG ASP GLU LYS GLU LYS GLU LYS GLY PRO ASN PRO PHE LEU LEU PRO THR MET GLU VAL GLU THR LEU ILE ARG ASN ALA SER ALA PRO PRO LEU SER

Row 10: ARG GLU GLN GLY ARG LEU SER GLY SER SER ARG GLY GLY PRO LEU PRO LEU ASP THR PHE PRO PHE ASP GLU ALA LEU ASP ARG ILE THR ALA ARG PRO SER SER VAL LEU PRO GLY VAL PRO ARG PRO ASP VAL THR HIS GLY GLN PHE LEU GLU ILE LYS

Row 11: MET ALA GLU ARG ARG GLU LEU GLU GLU ARG GLN MET LYS MET GLU ASN LEU PHE VAL THR TRP GLN GLN ARG SER THR PRO ALA THR MET PRO ILE SER ALA GLY GLU LEU GLU THR LEU TYR ASN ALA PRO ASP LEU GLY SER ARG HIS TYR CYS ALA THR ALA MET LEU PHE ASP PRO ALA ALA TRP

Row 12: LEU HIS GLY PRO GLU GLY THR SER GLY PRO ASP GLN ARG HIS ARG PRO GLU SER GLY SER ARG GLU ALA THR SER CYS GLU SER LEU ASP SER VAL SER PRO PRO GLY ALA ARG GLU GLU PRO TRP LEU LYS GLU LEU SER ALA PHE LEU GLN GLN TYR VAL

Row 13: GLN TYR LEU GLN SER ILE GLY PHE VAL LEU LEU VAL PRO LEU ARG PRO SER PRO ALA ARG SER THR SER ARG PRO ARG ALA MET ALA ILE LEU GLY THR GLY ARG GLY SER PHE SER CYS PRO LYS THR LYS ASP GLY SER PRO LYS SER THR SER SER PRO VAL THR THR TYR

Row 14: HIS LEU GLN ARG ALA LEU PRO GLY GLY ILE ILE LEU MET GLU LEU ALA PHE GLN GLY GLY CYS TYR PHE CYS VAL LYS GLN LEU ALA LEU GLU ASP SER ARG ILE PRO MET GLY GLN ALA VAL ASN SER GLN LEU SER MET LEU PHE THR GLU CYS ASP LYS VAL ARG ASP LEU MET HIS

Row 15: VAL HIS SER PHE SER TYR ASP PHE HIS LEU ARG LEU VAL HIS GLN HIS VAL LEU GLY ALA HIS LEU VAL LEU ARG HIS GLY PHE HIS LEU ALA HIS PRO ASP GLY HIS PHE ARG ASN HIS ILE TYR GLY THR LEU GLU LEU PRO

Row 16: THR PRO LEU ILE ALA ALA HIS GLN LEU TYR ASN TYR VAL ALA ASP HIS ALA SER TYR MET LYS PRO LEU ARG MET ALA ARG PRO GLY GLY GLU HIS ASN GLU TYR ALA LEU VAL VAL TRP HIS SER SER GLY SER TYR LEU ASP SER GLU GLY LEU GLU HIS GLN ASP

Row 17: ASP PHE ASP VAL SER LEU LEU VAL CYS HIS CYS ALA ALA PRO PHE GLU GLU GLN GLY GLU ALA GLU GLU ARG HIS LEU VAL LEU ARG LEU PHE GLN ALA ILE GLU GLY GLY VAL VAL LEU THR SER GLN ARG GLN ARG PHE ALA ASP MET ARG ARG PHE ARG LYS PRO GLY ARG ARG LEU PRO GLU

Row 18: PRO GLU ALA PRO GLY SER SER SER ALA GLY SER PRO GLY GLY ALA SER GLY LEU ILE LEU LEU ALA PRO GLY PRO ALA PRO LEU PHE PRO LEU ALA ALA GLU GLY VAL MET ALA ARG ALA ARG LEU ALA GLN LEU VAL ARG LEU ALA GLY LEU HIS CYS ARG ARG ASP THR LEU LEU TRP LYS ARG

Row 19: LEU PHE LEU LEU GLU PRO PRO GLY PRO GLY ASP ARG LEU ARG LEU GLY LEU GLY ARG LEU ALA LEU GLU LEU VAL HIS ALA LYS SER ILE GLY ASP ILE PRO ILE ASP PRO GLN LEU ASP CYS PHE LEU SER MET THR VAL SER TRP TYR GLN SER LEU ILE LYS VAL LEU

Row 20: LEU SER ARG PHE PRO GLN SER CYS ARG HIS PHE GLN SER PRO ASP LEU GLY THR GLN LEU VAL LEU VAL LEU ASN GLN LYS PHE THR ASP CYS PHE VAL LEU PHE LEU ASP SER HIS LEU GLY LYS THR SER LEU THR VAL VAL PHE ARG GLU PRO PHE PRO VAL GLN PRO GLN ASP

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

4 Experimental information ⓘ

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	491656	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 $(e^-/\text{Å}^2)$	50.1	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	1800	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	1.609	Depositor
Minimum map value	-0.768	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.020	Depositor
Recommended contour level	0.075	Depositor
Map size (Å)	510.0, 510.0, 510.0	wwPDB
Map dimensions	600, 600, 600	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.85, 0.85, 0.85	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	0.17	0/2776	0.35	0/3792
2	B	0.17	0/3110	0.43	0/4245
3	C	0.19	0/7163	0.32	0/9803
4	D	0.36	1/2045 (0.0%)	0.57	3/2801 (0.1%)
All	All	0.21	1/15094 (0.0%)	0.39	3/20641 (0.0%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	D	301	ASP	CA-C	-5.14	1.45	1.52

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	D	71	ASP	N-CA-C	-8.94	90.73	107.71
4	D	72	GLU	CA-C-N	7.14	128.77	119.84
4	D	72	GLU	C-N-CA	7.14	128.77	119.84

There are no chirality outliers.

There are no planarity outliers.

5.2   Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2716	0	2632	54	0
2	B	3045	0	2963	72	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	C	6981	0	6093	97	0
4	D	2005	0	1754	44	0
All	All	14747	0	13442	254	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 9.

All (254) 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:285:VAL:O	2:B:289:THR:OG1	2.07	0.72
2:B:255:ILE:HD11	2:B:324:ILE:HG21	1.70	0.72
3:C:1433:ASP:HB3	3:C:1436:ARG:HB3	1.71	0.72
3:C:231:VAL:O	3:C:233:GLU:N	2.25	0.69
3:C:38:ILE:HD11	3:C:90:VAL:H	1.59	0.68
3:C:128:ILE:HG12	3:C:129:THR:HG23	1.76	0.68
3:C:181:MET:HE2	3:C:338:PRO:HB3	1.76	0.67
2:B:144:ASN:OD1	2:B:147:ARG:NH2	2.28	0.67
2:B:274:LEU:HD12	2:B:275:PRO:O	1.95	0.66
3:C:1184:MET:HA	3:C:1190:GLY:HA3	1.77	0.66
1:A:202:GLY:O	1:A:315:GLN:NE2	2.29	0.66
3:C:1574:LYS:HA	3:C:1574:LYS:HE2	1.78	0.66
3:C:315:ASN:OD1	3:C:356:ARG:NH2	2.29	0.66
1:A:176:VAL:HG22	1:A:202:GLY:HA2	1.77	0.65
1:A:119:VAL:O	1:A:125:LYS:NZ	2.26	0.65
4:D:329:PRO:HD2	4:D:341:TYR:HE1	1.60	0.65
3:C:1309:PRO:HD3	3:C:1597:LYS:HB3	1.78	0.65
2:B:273:GLU:N	2:B:273:GLU:OE1	2.28	0.65
3:C:105:LYS:NZ	3:C:211:ASN:O	2.29	0.65
3:C:111:ARG:NH2	3:C:811:TYR:O	2.25	0.65
3:C:327:ASP:O	3:C:328:ARG:NH1	2.28	0.64
2:B:296:GLN:OE1	2:B:531:TYR:OH	2.16	0.64
2:B:212:CYS:O	2:B:234:LYS:NZ	2.29	0.64
3:C:123:SER:HA	3:C:156:ILE:O	1.96	0.64
1:A:108:TYR:OH	3:C:193:GLU:OE2	2.10	0.64
2:B:283:VAL:O	2:B:287:LYS:HG2	1.98	0.63
2:B:407:HIS:HB3	2:B:525:HIS:CD2	2.33	0.62
2:B:238:ALA:HB2	2:B:401:ARG:HH11	1.65	0.62
1:A:112:LEU:HD21	1:A:149:ILE:HG21	1.81	0.62
1:A:13:SER:OG	1:A:22:LYS:O	2.18	0.62
1:A:137:GLU:N	1:A:137:GLU:OE1	2.32	0.61

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:160:CYS:O	2:B:165:ARG:NH2	2.29	0.61
3:C:858:ARG:HG2	3:C:877:PRO:HB3	1.82	0.61
4:D:245:ILE:HA	4:D:248:LEU:HD12	1.83	0.60
1:A:138:GLU:O	1:A:142:SER:OG	2.17	0.60
4:D:95:ARG:HB3	4:D:251:LEU:HD22	1.82	0.60
4:D:111:ASP:OD1	4:D:111:ASP:N	2.34	0.60
2:B:98:THR:HG21	2:B:124:PHE:CE2	2.37	0.59
1:A:380:LYS:HG3	2:B:340:ALA:HB3	1.85	0.59
2:B:75:THR:OG1	2:B:76:LYS:N	2.34	0.59
3:C:1352:ARG:NH1	3:C:1374:TYR:OH	2.36	0.58
3:C:399:ILE:HD12	3:C:400:PRO:HD2	1.86	0.58
3:C:777:LEU:HD11	3:C:923:GLN:HE22	1.67	0.58
2:B:412:LEU:HD23	2:B:520:PHE:HB2	1.86	0.58
3:C:245:ASP:OD1	3:C:246:HIS:N	2.37	0.57
2:B:274:LEU:HD13	2:B:278:CYS:HB3	1.85	0.57
3:C:222:SER:O	3:C:305:ASN:ND2	2.33	0.57
4:D:34:TRP:HB3	4:D:38:HIS:CE1	2.39	0.57
4:D:34:TRP:HB3	4:D:38:HIS:HE1	1.70	0.56
1:A:324:ARG:HH12	2:B:567:LEU:HD21	1.71	0.56
3:C:129:THR:O	3:C:131:LYS:NZ	2.38	0.56
3:C:263:ARG:HD3	3:C:328:ARG:HH21	1.71	0.56
3:C:948:LEU:HA	3:C:1415:LEU:O	2.04	0.56
1:A:279:ARG:HA	2:B:413:MET:HE1	1.86	0.56
3:C:36:GLY:N	3:C:55:VAL:O	2.24	0.56
3:C:754:PRO:O	3:C:812:GLN:NE2	2.24	0.56
2:B:232:PRO:HB2	2:B:245:PRO:HB3	1.88	0.55
3:C:228:ALA:HB2	3:C:294:PRO:HG3	1.88	0.55
3:C:190:LEU:HB2	3:C:193:GLU:HG3	1.88	0.54
3:C:1448:LEU:HD21	3:C:1591:TRP:CE2	2.43	0.54
1:A:12:PHE:HB2	1:A:85:LEU:HD13	1.88	0.54
1:A:128:LEU:HB3	1:A:132:MET:HE2	1.89	0.54
2:B:293:LYS:NZ	2:B:297:GLN:O	2.39	0.54
2:B:331:ASN:OD1	2:B:331:ASN:N	2.41	0.54
3:C:1312:LEU:HD13	3:C:1595:LEU:HA	1.90	0.53
2:B:396:TRP:O	2:B:397:MET:HB3	2.09	0.53
3:C:772:GLU:HG3	3:C:875:TYR:HE1	1.73	0.53
3:C:1242:HIS:HA	3:C:1258:TYR:HA	1.90	0.53
4:D:34:TRP:HZ3	4:D:58:LEU:HB2	1.74	0.53
3:C:1419:VAL:HG13	3:C:1510:PHE:HZ	1.74	0.52
3:C:97:LEU:HA	3:C:146:VAL:HG22	1.92	0.52
4:D:21:LYS:HB3	4:D:57:GLU:O	2.09	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:360:ASP:O	2:B:363:SER:OG	2.26	0.52
4:D:115:GLU:OE1	4:D:123:HIS:CE1	2.62	0.52
1:A:129:VAL:O	1:A:133:THR:OG1	2.26	0.51
3:C:1206:ILE:HG22	3:C:1208:ALA:H	1.75	0.51
3:C:186:ILE:HG13	3:C:187:TYR:CD1	2.46	0.51
2:B:148:ARG:NH2	4:D:301:ASP:O	2.41	0.51
1:A:16:HIS:CD2	1:A:19:LEU:H	2.29	0.51
1:A:376:ILE:HD11	2:B:363:SER:HA	1.92	0.50
2:B:401:ARG:HG2	2:B:565:GLN:HA	1.94	0.50
3:C:769:ASP:O	3:C:878:LYS:N	2.42	0.50
1:A:297:LEU:HA	1:A:300:ARG:HB3	1.94	0.50
4:D:75:VAL:O	4:D:77:ARG:N	2.44	0.50
1:A:16:HIS:NE2	1:A:18:THR:OG1	2.35	0.50
2:B:98:THR:HG23	2:B:100:LEU:H	1.77	0.50
3:C:1548:TRP:CE2	3:C:1573:LEU:HG	2.47	0.50
1:A:287:SER:O	1:A:300:ARG:NH1	2.45	0.50
2:B:148:ARG:NH2	4:D:301:ASP:OD2	2.45	0.50
4:D:34:TRP:CZ3	4:D:58:LEU:HB2	2.46	0.50
3:C:306:TYR:CZ	3:C:310:ILE:HD11	2.47	0.49
3:C:1438:GLN:OE1	3:C:1547:ASN:ND2	2.45	0.49
3:C:1239:LEU:HD23	3:C:1239:LEU:H	1.76	0.49
4:D:127:ARG:CZ	4:D:127:ARG:HA	2.42	0.49
2:B:335:MET:SD	2:B:406:LEU:HD11	2.53	0.49
1:A:248:THR:HG22	1:A:250:LYS:H	1.76	0.49
3:C:123:SER:CA	3:C:156:ILE:O	2.60	0.49
1:A:15:PHE:HB2	1:A:82:LEU:HB2	1.95	0.49
2:B:404:ILE:HG22	2:B:565:GLN:HG3	1.95	0.49
3:C:321:TYR:CZ	3:C:940:LYS:HG2	2.47	0.49
2:B:148:ARG:O	2:B:152:VAL:HG22	2.13	0.48
2:B:556:HIS:ND1	2:B:557:GLU:O	2.46	0.48
3:C:373:PRO:O	3:C:422:ARG:NH2	2.46	0.48
4:D:182:PHE:O	4:D:186:ILE:HG12	2.13	0.48
1:A:73:HIS:HB3	1:A:76:TYR:CE2	2.48	0.48
2:B:412:LEU:HG	2:B:521:ARG:HH22	1.77	0.48
3:C:113:ASP:HB3	3:C:137:ILE:HD11	1.95	0.48
3:C:285:VAL:HG12	3:C:285:VAL:O	2.13	0.48
3:C:357:MET:HE3	3:C:357:MET:O	2.14	0.48
3:C:305:ASN:O	3:C:308:GLU:HG2	2.14	0.48
3:C:794:THR:OG1	3:C:797:GLN:OE1	2.31	0.48
1:A:112:LEU:HD23	1:A:118:PHE:CG	2.49	0.48
1:A:21:PRO:HB3	1:A:45:ILE:HD13	1.95	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:152:VAL:HG12	4:D:116:ILE:HD11	1.96	0.48
3:C:217:THR:HG23	3:C:260:GLN:HA	1.95	0.48
1:A:129:VAL:HA	1:A:132:MET:HE3	1.95	0.47
3:C:753:LEU:HD12	3:C:754:PRO:HD2	1.96	0.47
2:B:527:GLU:HA	2:B:530:MET:HB2	1.94	0.47
1:A:175:PRO:HD2	1:A:204:ARG:O	2.13	0.47
2:B:332:ASN:O	2:B:374:LEU:N	2.47	0.47
4:D:150:TYR:HE1	4:D:173:LEU:HD23	1.79	0.47
2:B:92:ARG:NH2	2:B:132:ALA:O	2.38	0.47
4:D:98:ILE:HB	4:D:153:ILE:HG23	1.97	0.47
4:D:310:VAL:HG23	4:D:324:TYR:OH	2.14	0.47
2:B:525:HIS:CG	2:B:526:LEU:N	2.81	0.47
4:D:93:GLN:NE2	4:D:94:TYR:O	2.48	0.47
3:C:995:ARG:HH11	3:C:995:ARG:HB2	1.78	0.47
1:A:11:PHE:O	1:A:85:LEU:HD12	2.14	0.47
2:B:343:CYS:C	2:B:345:TYR:H	2.23	0.47
2:B:368:PHE:CE2	2:B:397:MET:HE1	2.50	0.47
3:C:987:VAL:HG23	3:C:1255:PHE:CD2	2.50	0.47
2:B:394:VAL:O	2:B:398:LEU:HB2	2.15	0.47
3:C:1585:ASN:O	3:C:1589:THR:OG1	2.29	0.47
3:C:168:SER:HB3	3:C:328:ARG:HD3	1.97	0.46
1:A:347:GLY:HA3	2:B:344:LEU:HG	1.97	0.46
1:A:270:LYS:HB2	1:A:270:LYS:HE2	1.79	0.46
3:C:760:PHE:CD1	3:C:761:PRO:HD2	2.51	0.46
2:B:222:ASN:HB3	2:B:224:TRP:CD1	2.51	0.46
4:D:315:PHE:O	4:D:318:MET:HG3	2.16	0.46
3:C:1225:ALA:O	3:C:1228:ILE:HG13	2.16	0.46
3:C:216:VAL:HB	3:C:267:TRP:CH2	2.51	0.46
3:C:864:THR:HG23	3:C:871:THR:HB	1.97	0.46
2:B:327:PRO:O	2:B:332:ASN:ND2	2.45	0.46
2:B:336:LEU:HD23	2:B:368:PHE:O	2.15	0.46
4:D:46:THR:HB	4:D:50:MET:SD	2.56	0.45
1:A:177:PHE:HZ	1:A:197:LEU:HD22	1.81	0.45
1:A:305:LEU:HD23	1:A:308:VAL:CG2	2.46	0.45
2:B:267:GLU:HG3	2:B:286:ILE:HG22	1.99	0.45
3:C:369:MET:HB3	3:C:369:MET:HE3	1.72	0.45
4:D:177:SER:O	4:D:177:SER:OG	2.24	0.45
1:A:175:PRO:HA	1:A:234:THR:O	2.17	0.45
3:C:1548:TRP:CZ2	3:C:1573:LEU:HG	2.52	0.45
1:A:15:PHE:CE1	1:A:21:PRO:HD3	2.51	0.45
2:B:148:ARG:HG2	4:D:109:VAL:HG21	1.99	0.45

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:246:HIS:O	3:C:246:HIS:ND1	2.45	0.45
3:C:302:ALA:HA	3:C:343:PHE:HA	1.98	0.45
4:D:127:ARG:HA	4:D:127:ARG:NE	2.32	0.45
1:A:301:HIS:HB3	1:A:304:GLN:HB2	1.97	0.45
2:B:396:TRP:CD1	2:B:399:GLN:HE21	2.34	0.45
1:A:228:LEU:HD11	1:A:235:LEU:HG	1.99	0.45
1:A:242:SER:OG	1:A:295:ARG:NH2	2.50	0.45
2:B:301:ASP:OD1	2:B:301:ASP:N	2.49	0.45
3:C:106:ASP:OD1	3:C:328:ARG:NH1	2.38	0.45
3:C:171:VAL:HG22	3:C:216:VAL:HA	1.98	0.45
3:C:1511:LEU:HD12	3:C:1511:LEU:HA	1.81	0.45
3:C:947:LEU:HD12	3:C:1503:ILE:HD13	1.99	0.45
2:B:252:LEU:HD21	2:B:317:VAL:HG11	1.98	0.44
3:C:1426:LEU:HB2	3:C:1429:TYR:CE2	2.52	0.44
2:B:24:PHE:CE2	2:B:26:TYR:HB2	2.52	0.44
2:B:558:ASP:OD1	2:B:561:ILE:N	2.37	0.44
3:C:948:LEU:HB3	3:C:1384:PHE:HB3	1.99	0.44
3:C:956:THR:HG21	3:C:1562:ALA:O	2.18	0.44
3:C:896:HIS:CG	3:C:1439:LEU:HD12	2.53	0.44
3:C:925:ILE:HD11	3:C:1392:ALA:HB2	2.00	0.44
2:B:156:GLU:HB3	2:B:162:TYR:HB3	2.00	0.44
3:C:323:ASN:ND2	3:C:1420:LEU:HD23	2.33	0.44
1:A:310:GLU:H	1:A:310:GLU:CD	2.25	0.44
3:C:53:LEU:HD23	3:C:53:LEU:HA	1.87	0.44
1:A:85:LEU:HD23	1:A:105:LEU:CD2	2.47	0.44
1:A:104:LYS:NZ	3:C:189:ASP:HA	2.33	0.44
2:B:135:ASP:OD1	2:B:137:SER:N	2.44	0.44
2:B:20:ASN:HD22	2:B:71:THR:HA	1.83	0.43
4:D:92:TRP:CD1	4:D:92:TRP:C	2.96	0.43
1:A:77:SER:OG	1:A:78:ARG:N	2.50	0.43
3:C:378:PRO:HD2	3:C:400:PRO:HG2	1.99	0.43
4:D:91:ALA:HB3	4:D:94:TYR:CZ	2.54	0.43
1:A:186:ASN:OD1	1:A:186:ASN:N	2.50	0.43
1:A:351:TYR:CE2	1:A:365:LEU:HD23	2.54	0.43
2:B:156:GLU:CD	2:B:159:ARG:HH21	2.26	0.43
4:D:93:GLN:HG3	4:D:95:ARG:NH1	2.33	0.43
3:C:40:GLU:OE2	3:C:50:PRO:HB3	2.19	0.43
3:C:277:LEU:HD23	3:C:277:LEU:HA	1.86	0.43
3:C:1205:PHE:CD2	3:C:1210:VAL:HG11	2.54	0.43
4:D:50:MET:O	4:D:50:MET:HE2	2.18	0.43
1:A:305:LEU:CD2	1:A:308:VAL:CG2	2.96	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:6:VAL:HG13	3:C:44:PRO:HG2	2.01	0.43
4:D:97:VAL:HA	4:D:152:THR:O	2.19	0.43
1:A:11:PHE:HB2	1:A:23:ILE:HD11	2.01	0.42
3:C:1352:ARG:HB2	3:C:1374:TYR:CZ	2.53	0.42
3:C:200:LEU:HD23	3:C:200:LEU:HA	1.81	0.42
2:B:361:LEU:HA	2:B:364:VAL:HG12	2.01	0.42
3:C:379:LEU:HD12	3:C:379:LEU:HA	1.82	0.42
2:B:550:VAL:HG13	2:B:551:LEU:HG	2.02	0.42
3:C:1234:MET:SD	3:C:1239:LEU:HD21	2.60	0.42
4:D:101:ASP:OD1	4:D:263:THR:HA	2.20	0.42
2:B:284:ARG:O	2:B:288:THR:HG22	2.20	0.42
2:B:291:ALA:HB1	2:B:328:LEU:HD13	2.02	0.42
4:D:115:GLU:OE2	4:D:119:ASP:HB2	2.20	0.42
1:A:73:HIS:HB3	1:A:76:TYR:HE2	1.85	0.42
2:B:373:SER:HB2	2:B:376:GLU:HG2	2.01	0.42
2:B:393:MET:O	2:B:397:MET:HG2	2.20	0.42
3:C:890:TYR:HE2	3:C:892:LEU:HB2	1.85	0.42
1:A:98:LEU:HD12	1:A:98:LEU:HA	1.81	0.42
1:A:238:ILE:HD12	1:A:238:ILE:H	1.84	0.42
4:D:92:TRP:HD1	4:D:92:TRP:O	2.03	0.42
3:C:313:SER:HA	3:C:316:VAL:HG12	2.00	0.41
4:D:94:TYR:HB2	4:D:149:ILE:HD13	2.00	0.41
4:D:265:GLY:O	4:D:309:ASN:N	2.51	0.41
4:D:275:CYS:O	4:D:279:LEU:HG	2.20	0.41
2:B:318:TYR:HE2	4:D:301:ASP:HA	1.86	0.41
4:D:19:LEU:HD12	4:D:20:MET:N	2.36	0.41
1:A:258:LYS:HA	1:A:261:GLN:HG3	2.02	0.41
2:B:80:CYS:SG	2:B:97:PRO:HB2	2.61	0.41
2:B:238:ALA:HB2	2:B:401:ARG:NH1	2.33	0.41
3:C:177:MET:HB3	3:C:177:MET:HE3	1.82	0.41
1:A:147:LEU:HD12	1:A:148:PRO:HD2	2.01	0.41
4:D:179:ARG:O	4:D:183:LEU:HG	2.20	0.41
1:A:9:CYS:SG	1:A:10:ILE:N	2.93	0.41
3:C:102:LEU:HB3	3:C:139:ALA:HB1	2.01	0.41
4:D:184:GLN:NE2	4:D:188:GLU:OE2	2.54	0.41
2:B:68:ILE:HD13	2:B:68:ILE:HA	1.92	0.41
2:B:525:HIS:CD2	2:B:526:LEU:H	2.37	0.41
3:C:109:ILE:HG23	3:C:113:ASP:HB2	2.01	0.41
3:C:97:LEU:HD22	3:C:144:LEU:HB3	2.01	0.41
3:C:1317:PRO:HD2	3:C:1464:THR:HG21	2.02	0.41
3:C:1512:GLN:HB3	3:C:1547:ASN:HB2	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:16:GLY:HA2	2:B:122:ILE:HG22	2.03	0.41
2:B:68:ILE:O	2:B:72:ILE:HG12	2.20	0.41
1:A:32:ILE:HD11	1:A:88:VAL:HG21	2.02	0.41
2:B:94:VAL:O	2:B:127:VAL:HA	2.21	0.41
3:C:777:LEU:HD12	3:C:777:LEU:HA	1.78	0.41
3:C:1228:ILE:HG22	3:C:1251:PHE:HE2	1.84	0.41
3:C:801:GLU:HG2	3:C:925:ILE:HD12	2.02	0.41
3:C:1227:ALA:O	3:C:1230:ILE:HG13	2.21	0.41
4:D:94:TYR:OH	4:D:346:LEU:O	2.32	0.41
2:B:307:LEU:HB2	4:D:311:GLU:OE2	2.21	0.40
1:A:136:LEU:HB3	1:A:137:GLU:OE1	2.21	0.40
1:A:173:ASP:OD1	1:A:173:ASP:N	2.54	0.40
1:A:193:THR:O	1:A:197:LEU:HG	2.21	0.40
2:B:238:ALA:HB3	2:B:566:ALA:HB2	2.03	0.40
4:D:128:CYS:O	4:D:132:LEU:HB2	2.22	0.40
3:C:104:PHE:O	3:C:167:THR:OG1	2.39	0.40
3:C:1254:GLY:HA3	3:C:1298:PHE:HD2	1.87	0.40
4:D:72:GLU:HA	4:D:73:PRO:HD2	1.73	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	359/380 (94%)	335 (93%)	23 (6%)	1 (0%)	37	68
2	B	394/569 (69%)	360 (91%)	31 (8%)	3 (1%)	16	48
3	C	928/1603 (58%)	862 (93%)	61 (7%)	5 (0%)	25	59
4	D	278/3432 (8%)	258 (93%)	19 (7%)	1 (0%)	30	63
All	All	1959/5984 (33%)	1815 (93%)	134 (7%)	10 (0%)	27	59

All (10) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	B	200	LEU
2	B	397	MET
3	C	237	ILE
3	C	1216	ASN
1	A	295	ARG
3	C	231	VAL
3	C	232	ASP
4	D	73	PRO
3	C	1261	VAL
2	B	275	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	273/351 (78%)	260 (95%)	13 (5%)	21	53
2	B	300/504 (60%)	281 (94%)	19 (6%)	15	43
3	C	606/1412 (43%)	581 (96%)	25 (4%)	26	58
4	D	175/2957 (6%)	165 (94%)	10 (6%)	17	47
All	All	1354/5224 (26%)	1287 (95%)	67 (5%)	23	52

All (67) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	128	LEU
1	A	178	THR
1	A	186	ASN
1	A	187	SER
1	A	234	THR
1	A	255	VAL
1	A	260	LEU
1	A	293	THR
1	A	323	ILE
1	A	327	GLN
1	A	351	TYR
1	A	362	TYR

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Mol	Chain	Res	Type
1	A	371	ASN
2	B	10	VAL
2	B	75	THR
2	B	85	GLU
2	B	99	LEU
2	B	146	SER
2	B	163	LEU
2	B	221	ILE
2	B	262	LEU
2	B	263	LEU
2	B	270	LEU
2	B	282	LEU
2	B	285	VAL
2	B	325	ILE
2	B	331	ASN
2	B	359	HIS
2	B	403	LEU
2	B	550	VAL
2	B	565	GLN
2	B	567	LEU
3	C	38	ILE
3	C	95	VAL
3	C	103	THR
3	C	105	LYS
3	C	151	VAL
3	C	160	THR
3	C	167	THR
3	C	171	VAL
3	C	259	VAL
3	C	308	GLU
3	C	357	MET
3	C	377	VAL
3	C	864	THR
3	C	895	SER
3	C	944	THR
3	C	960	THR
3	C	965	HIS
3	C	1216	ASN
3	C	1353	THR
3	C	1358	VAL
3	C	1419	VAL
3	C	1515	TYR

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Mol	Chain	Res	Type
3	C	1557	THR
3	C	1563	THR
3	C	1573	LEU
4	D	21	LYS
4	D	88	THR
4	D	109	VAL
4	D	111	ASP
4	D	117	LEU
4	D	132	LEU
4	D	195	ASP
4	D	201	LEU
4	D	327	THR
4	D	351	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (9) such sidechains are listed below:

Mol	Chain	Res	Type
3	C	176	GLN
3	C	238	ASN
3	C	398	ASN
3	C	805	GLN
3	C	885	GLN
3	C	1406	HIS
3	C	1547	ASN
4	D	40	HIS
4	D	178	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry ⓘ

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-64665. 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 ⓘ
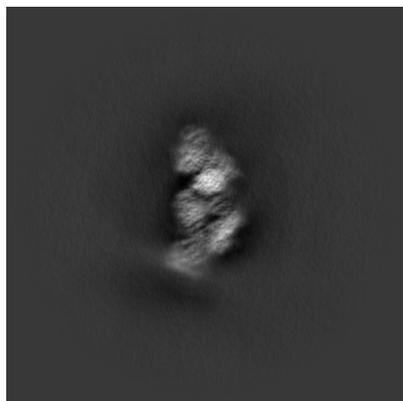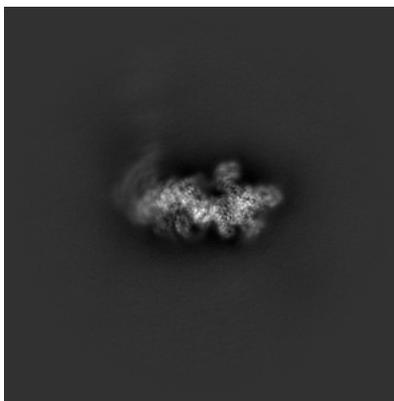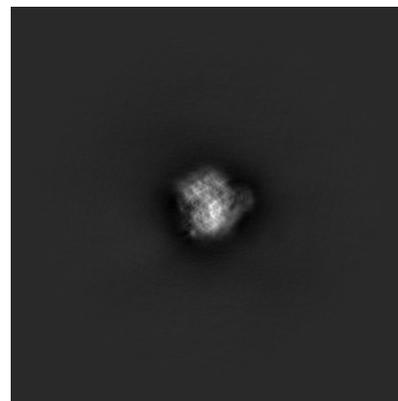
6.1.1　Primary map

X　　　　　　　　　　　　　　Y　　　　　　　　　　　　　　Z

6.1.2　Raw map

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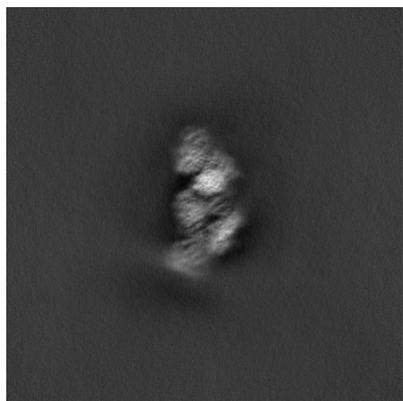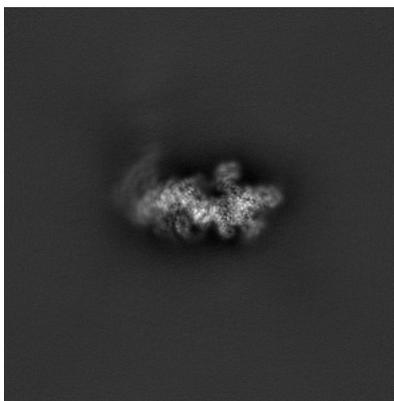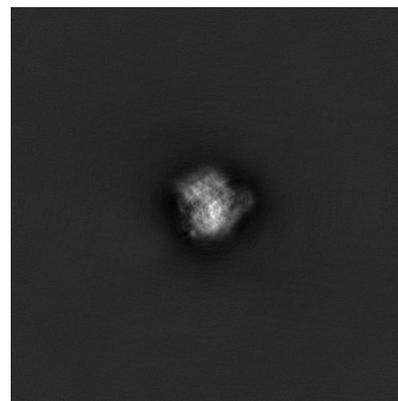
The images above show the map projected in three orthogonal directions.

6.2 Central slices ⓘ
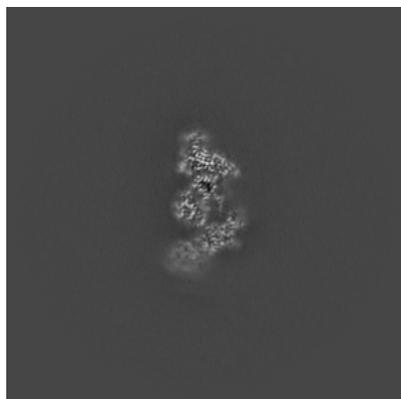
6.2.1 Primary map
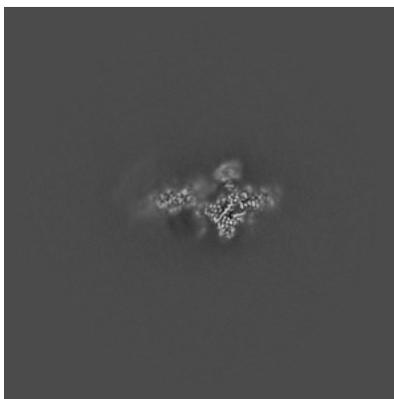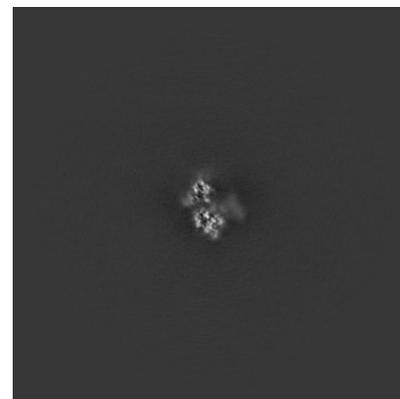
X Index: 300	Y Index: 300	Z Index: 300

6.2.2 Raw map
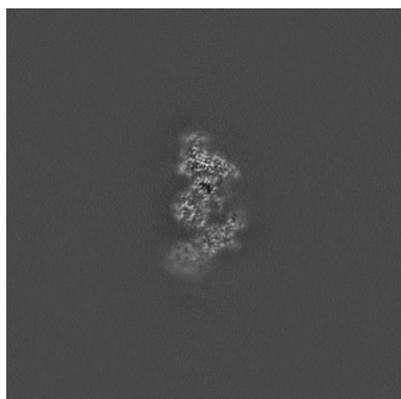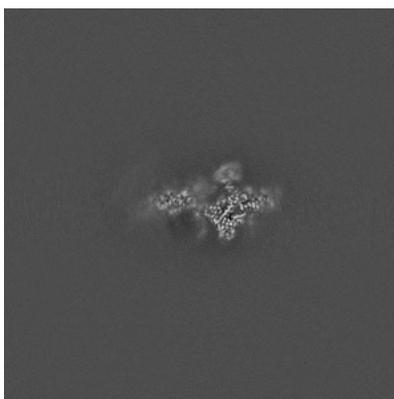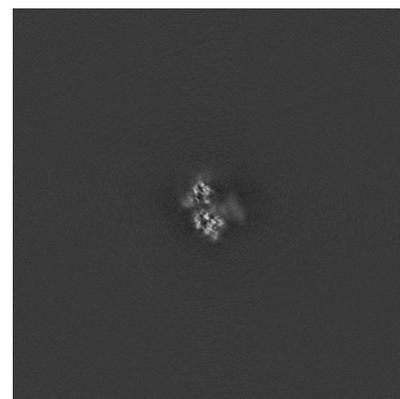
X Index: 300	Y Index: 300	Z Index: 300

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

6.3 Largest variance slices (i)

6.3.1 Primary map
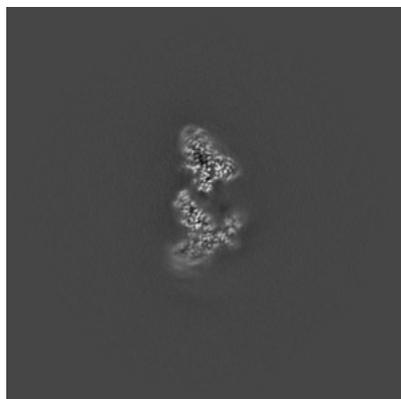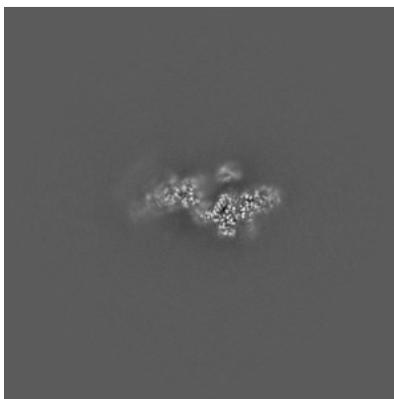
| X Index: 308 | Y Index: 293 | Z Index: 343 |
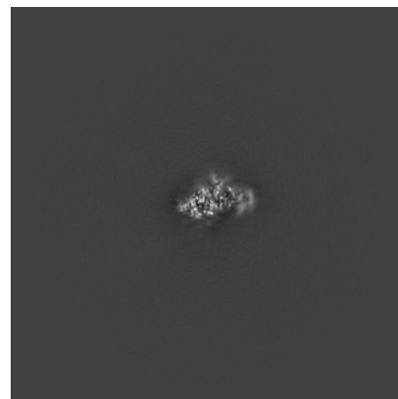
6.3.2 Raw map
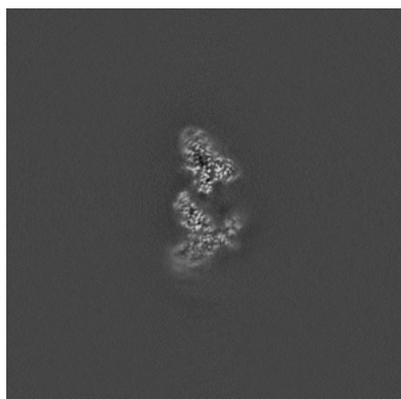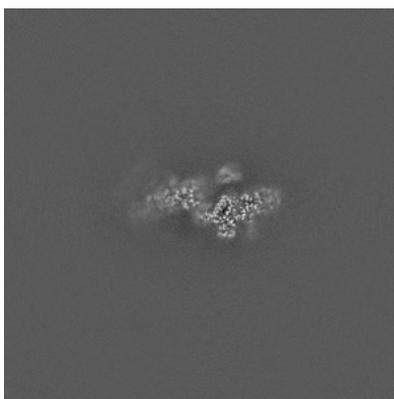
| X Index: 308 | Y Index: 294 | Z Index: 343 |
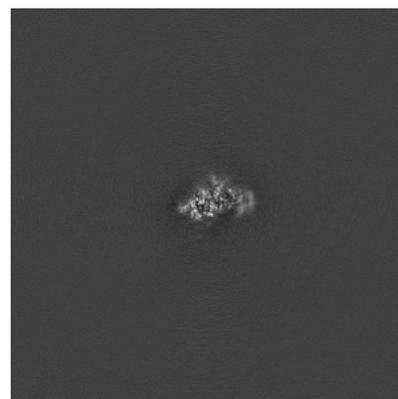
The images above show the largest variance slices of the map in three orthogonal directions.

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

6.4.1 Primary map
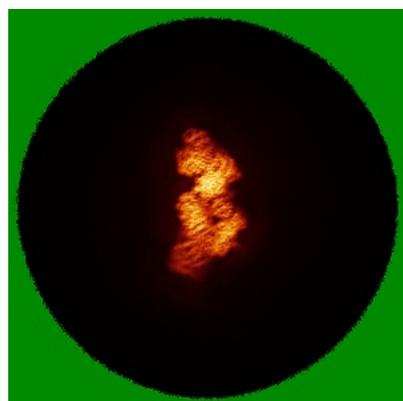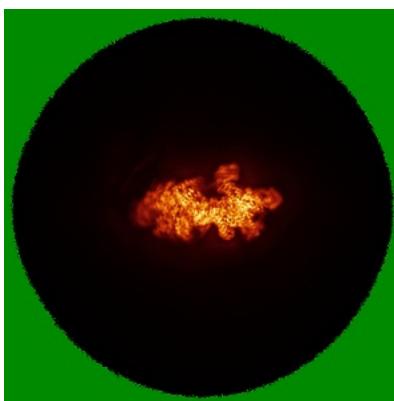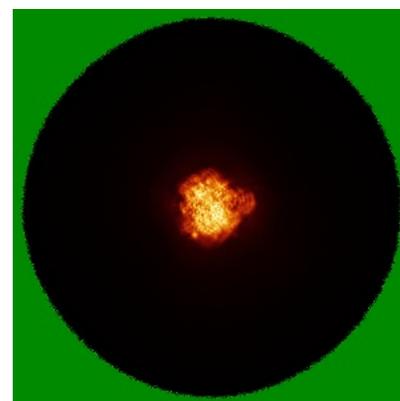
X	Y	Z

6.4.2 Raw map

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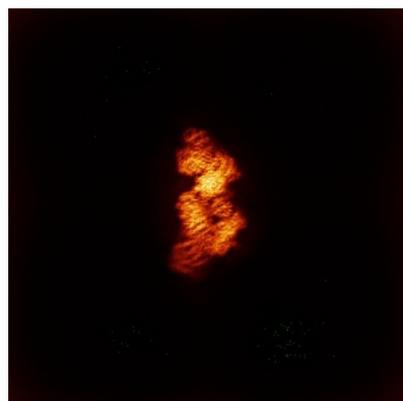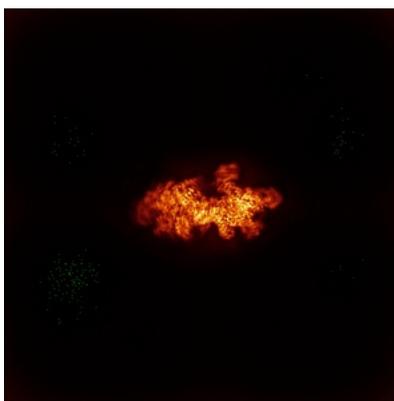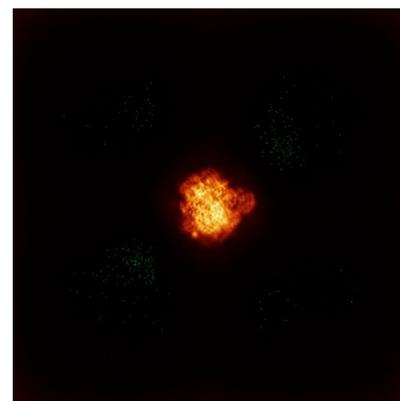
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views ⓘ

6.5.1 Primary map

X	Y	Z
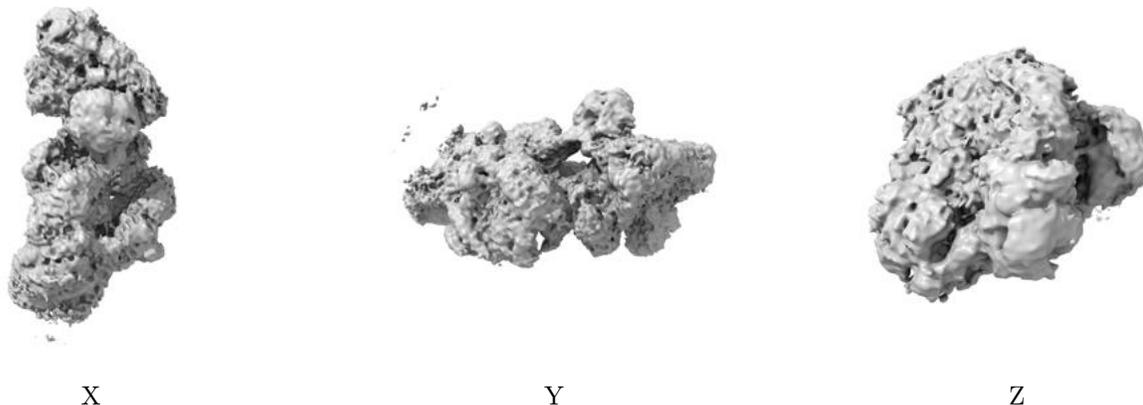
The images above show the 3D surface view of the map at the recommended contour level 0.075. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

6.5.2 Raw map

X	Y	Z
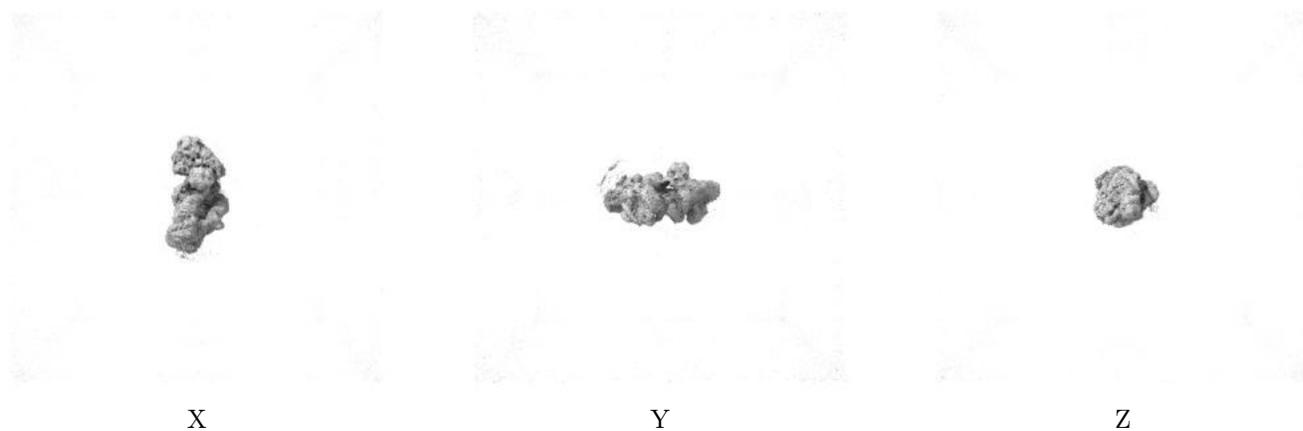
These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

6.6 Mask visualisation ⓘ

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

A mask typically either:

- Encompasses the whole structure

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

6.6.1 emd_64665_msk_1.map ⓘ

X   Y   Z
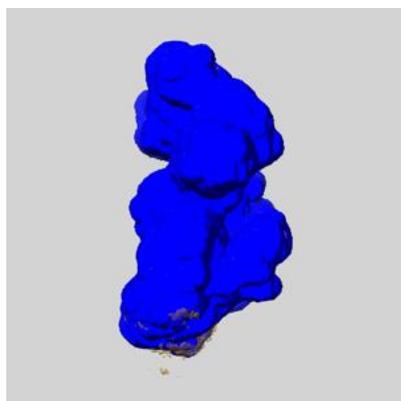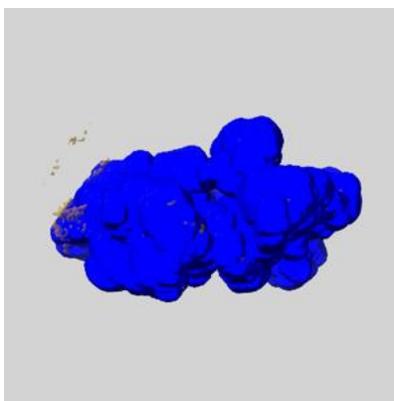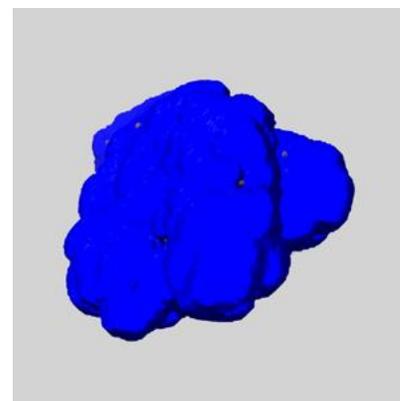
7 Map analysis ⓘ

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

7.1 Map-value distribution ⓘ

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

7.2 Volume estimate ⓘ
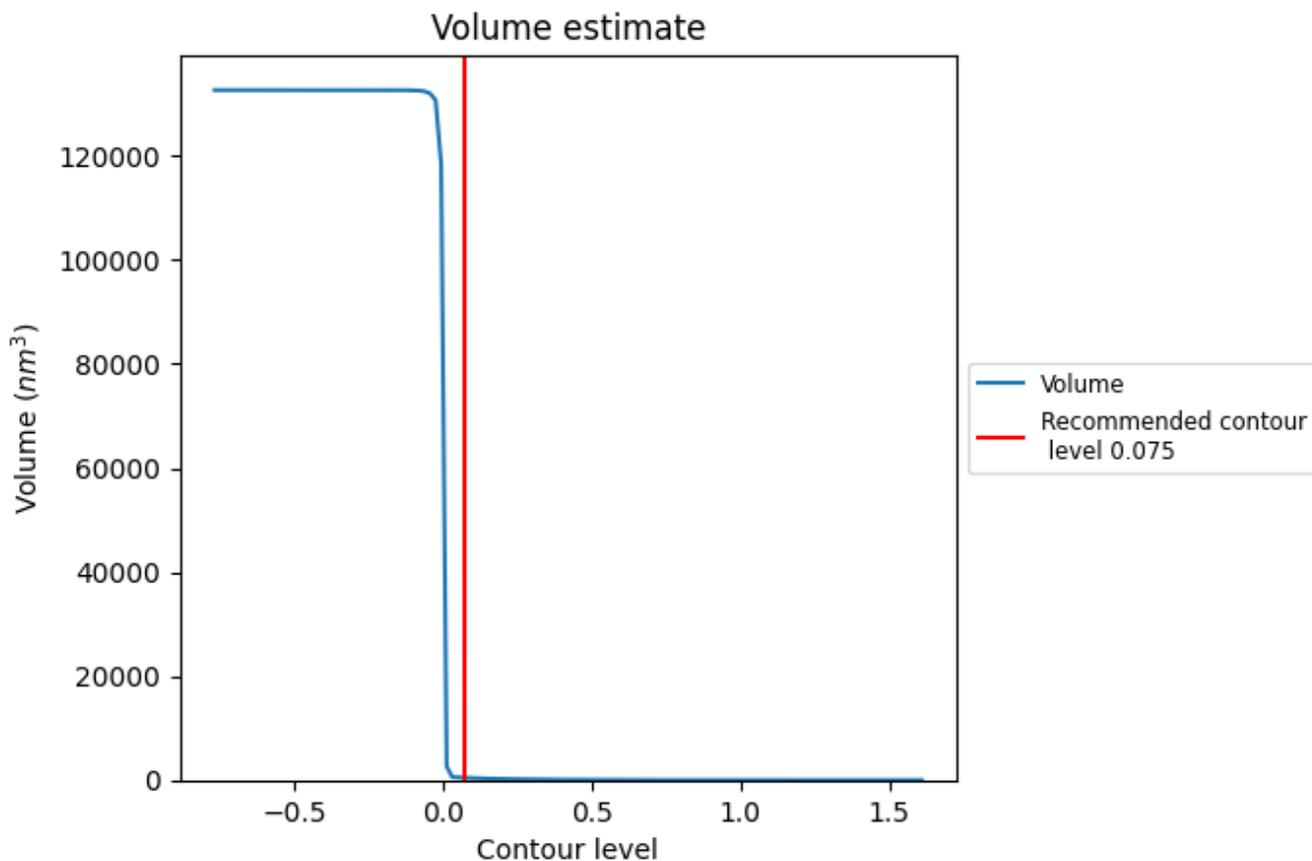
The volume at the recommended contour level is 435 nm^3; this corresponds to an approximate mass of 393 kDa.

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 ⓘ
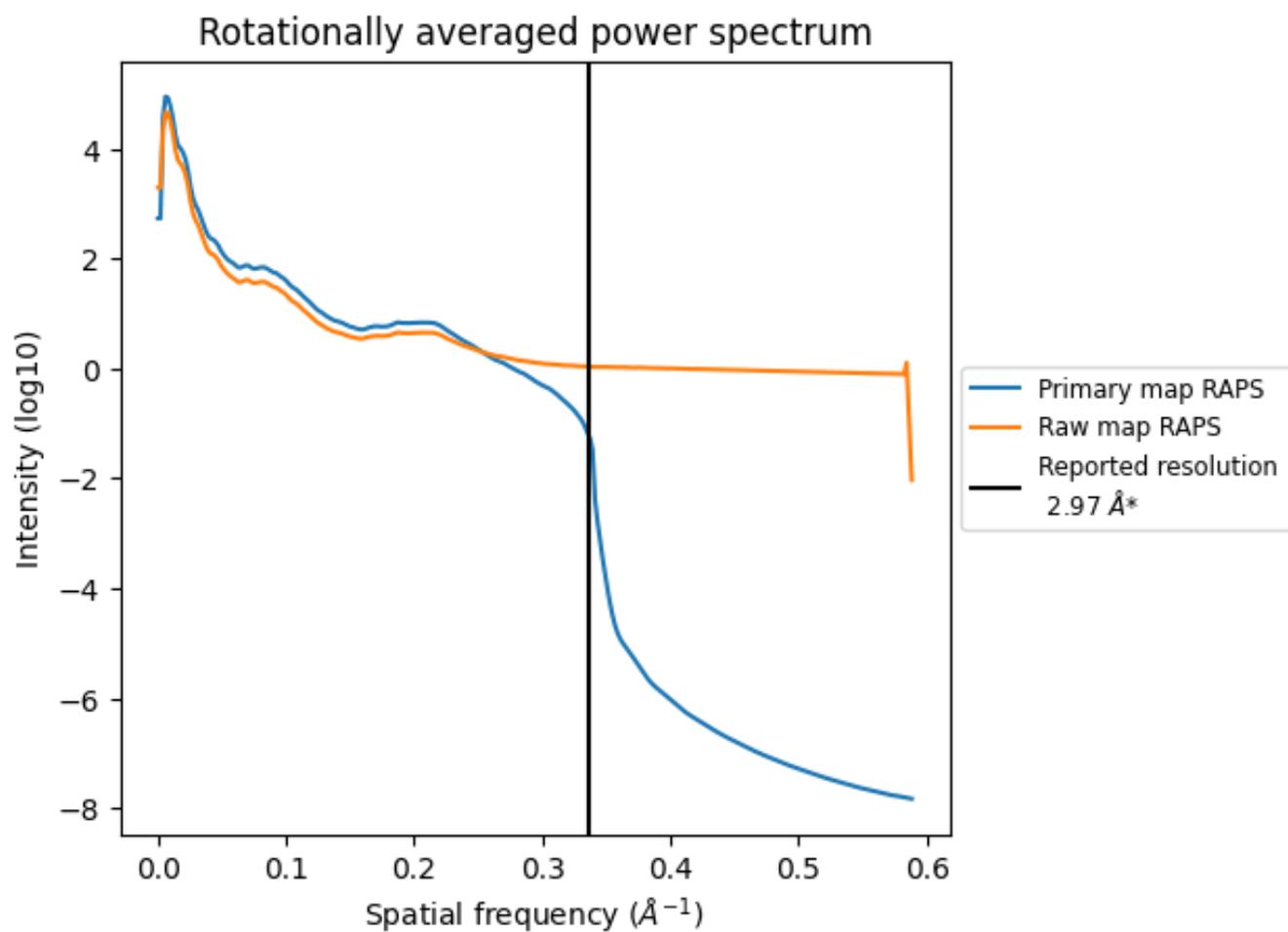
*Reported resolution corresponds to spatial frequency of 0.337 Å^{-1}

8 Fourier-Shell correlation ⓘ

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC ⓘ
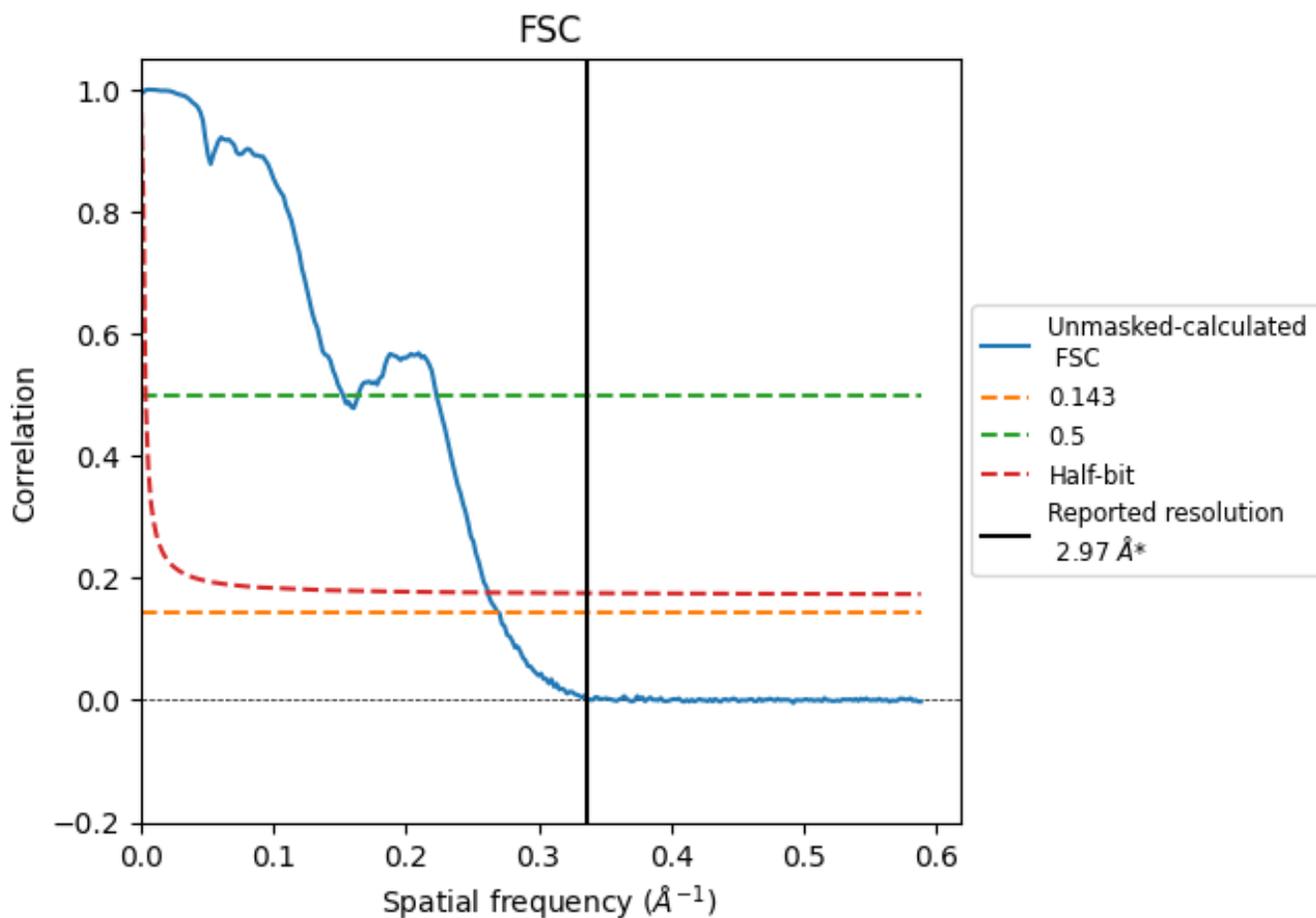
*Reported resolution corresponds to spatial frequency of 0.337 Å^{-1}

8.2 Resolution estimates ⓘ

Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.97	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.70	6.55	3.82

*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 3.70 differs from the reported value 2.97 by more than 10 %

9 Map-model fit ⓘ

This section contains information regarding the fit between EMDB map EMD-64665 and PDB model 9V0J. Per-residue inclusion information can be found in section 3 on page 4.

9.1 Map-model overlay ⓘ

X	Y	Z
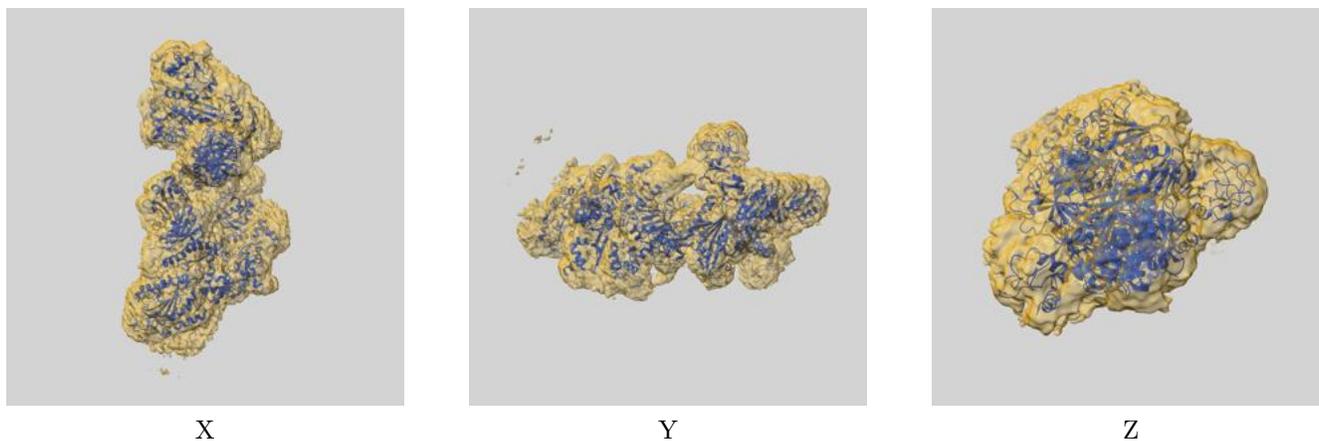
The images above show the 3D surface view of the map at the recommended contour level 0.075 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2　Q-score mapped to coordinate model ⓘ

X　　　　　　　　　　　　　Y　　　　　　　　　　　　　Z
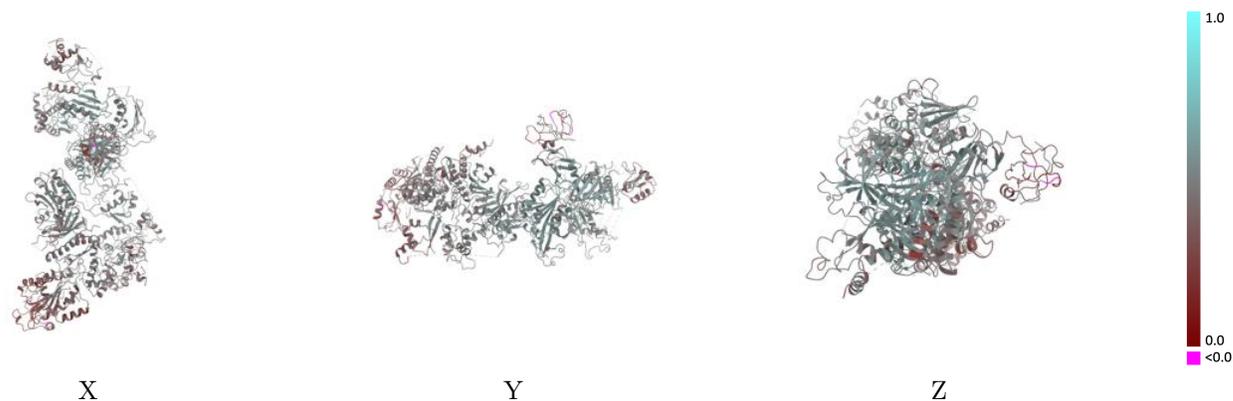
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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
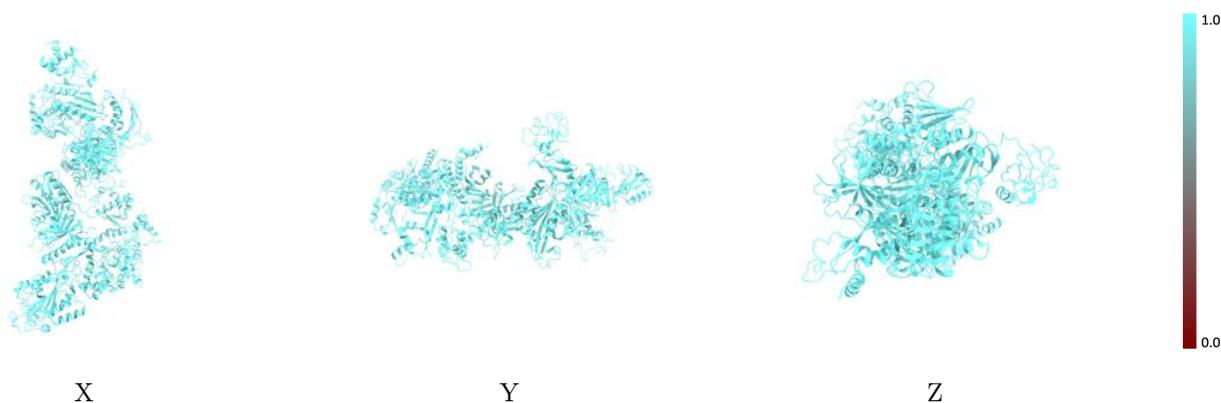
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.075).

9.4　Atom inclusion ⓘ
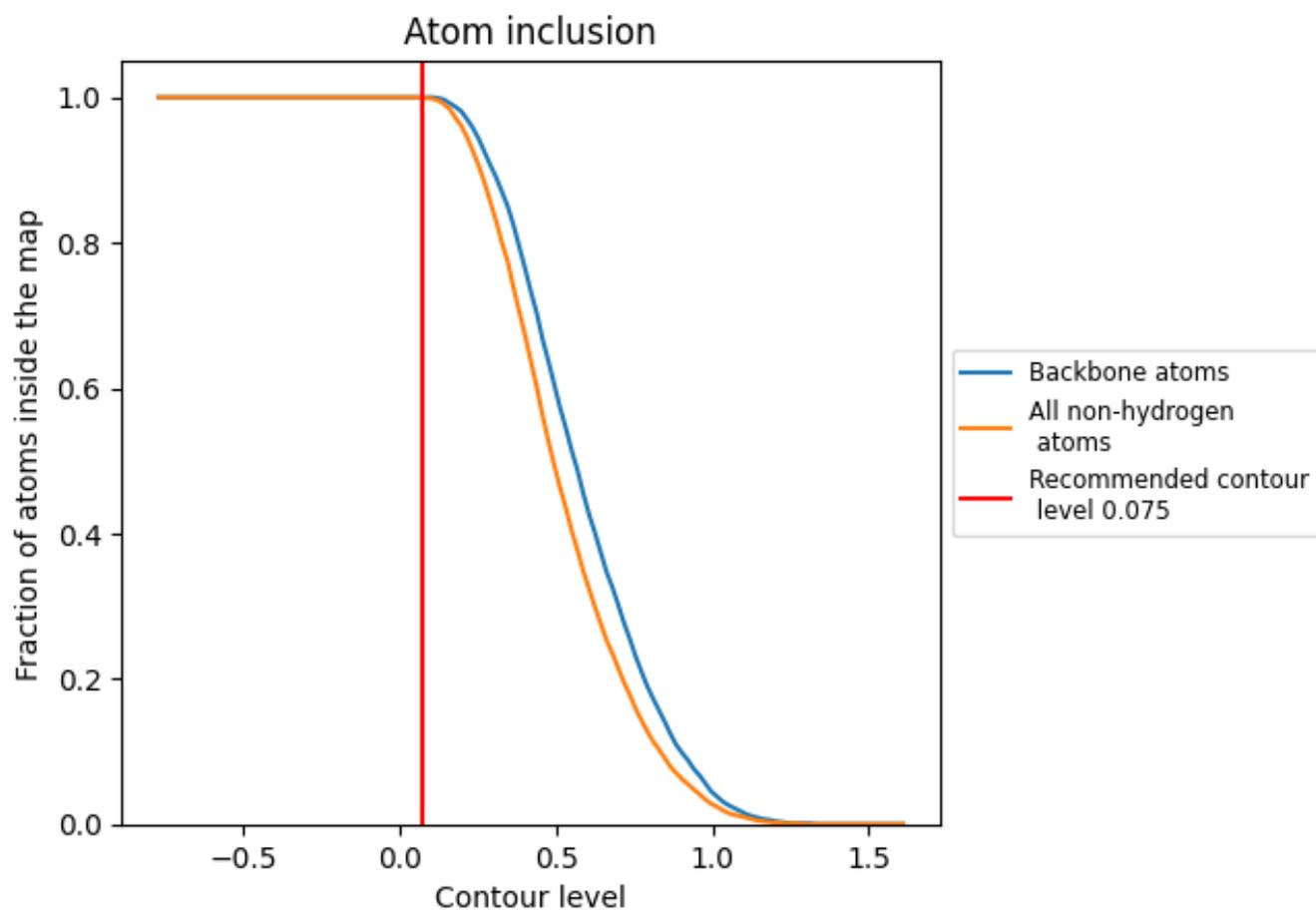
At the recommended contour level, 100% of all backbone atoms, 100% of all non-hydrogen atoms, are inside the map.

9.5   Map-model fit summary (i)

The table lists the average atom inclusion at the recommended contour level (0.075) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.9990	0.4700
A	1.0000	0.4940
B	0.9990	0.4620
C	0.9990	0.5000
D	1.0000	0.3470

1.0

0.0

<0.0