Full wwPDB EM Validation Report

Oct 27, 2026 – 04:12 PM EDT

PDB ID	:	11PH / pdb_000011ph
EMDB ID	:	EMD-75922
Title	:	Cryo-EM structure of CAS:Ran-GTP:importin alpha 5 complex
Authors	:	Kumar, P.; Suinn, S.S.; Bellis, F.N.; Vinkemeier, U.; Cingolani, G.
Deposited on	:	2026-03-08
Resolution	:	3.20 Å(reported)
Based on initial model	:	.

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 (1)) were used in the production of this report:

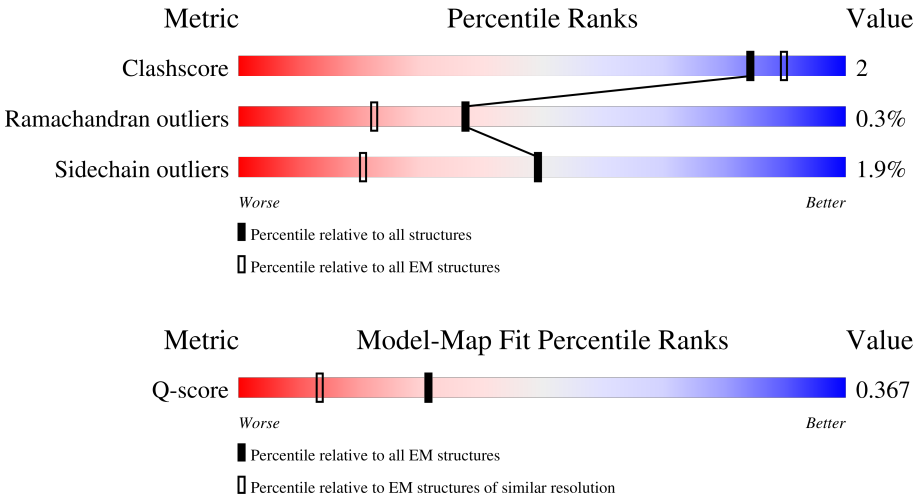
EMDB validation analysis	:	0.0.1.dev133
Mogul	:	2022.3.0, CSD as543be (2022)
MolProbity	:	4-5-2 with Phenix2.2
Buster-report	:	wwPDB partial adaption of 1.1.7 (2018)
Percentile statistics	:	20250101.v01 (using entries in the PDB archive January 1st 2025)
EM percentile statistics	:	202505.v01 (Using data 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)	:	2.51

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 3.20 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)	Similar EM resolution (#Entries, resolution range(Å))
Clashscore	229148	23984	-
Ramachandran outliers	224038	23583	-
Sidechain outliers	223484	23102	-
Q-score	-	25397	15020 (2.70 - 3.70)

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	563	19% 76% 6% 18%
2	C	220	13% 68% 10% 22%
3	B	980	19% 51% • 46%

2 Entry composition (i)

There are 5 unique types of molecules in this entry. The entry contains 18644 atoms, of which 9328 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 Importin subunit alpha-5.

Mol	Chain	Residues	Atoms						AltConf	Trace
			Total	C	H	N	O	S		
1	A	461	7251	2280	3645	622	685	19	0	0

There are 26 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-24	GLY	-	expression tag	UNP P52294
A	-23	PRO	-	expression tag	UNP P52294
A	-22	LEU	-	expression tag	UNP P52294
A	-21	GLY	-	expression tag	UNP P52294
A	-20	SER	-	expression tag	UNP P52294
A	-19	PRO	-	expression tag	UNP P52294
A	-18	ASN	-	expression tag	UNP P52294
A	-17	SER	-	expression tag	UNP P52294
A	-16	ARG	-	expression tag	UNP P52294
A	-15	VAL	-	expression tag	UNP P52294
A	-14	ASP	-	expression tag	UNP P52294
A	-13	ALA	-	expression tag	UNP P52294
A	-12	ALA	-	expression tag	UNP P52294
A	-11	THR	-	expression tag	UNP P52294
A	-10	MET	-	expression tag	UNP P52294
A	-9	ASP	-	expression tag	UNP P52294
A	-8	TYR	-	expression tag	UNP P52294
A	-7	LYS	-	expression tag	UNP P52294
A	-6	ASP	-	expression tag	UNP P52294
A	-5	ASP	-	expression tag	UNP P52294
A	-4	ASP	-	expression tag	UNP P52294
A	-3	ASP	-	expression tag	UNP P52294
A	-2	LYS	-	expression tag	UNP P52294
A	-1	GLU	-	expression tag	UNP P52294
A	0	PHE	-	expression tag	UNP P52294
A	73	ASN	SER	variant	UNP P52294

- Molecule 2 is a protein called GTP-binding nuclear protein Ran.

Mol	Chain	Residues	Atoms						AltConf	Trace
2	C	172	Total	C	H	N	O	S	0	0
			2820	909	1422	245	239	5		

There are 5 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	-3	GLY	-	expression tag	UNP P62826
C	-2	PRO	-	expression tag	UNP P62826
C	-1	GLY	-	expression tag	UNP P62826
C	0	SER	-	expression tag	UNP P62826
C	69	LEU	GLN	conflict	UNP P62826

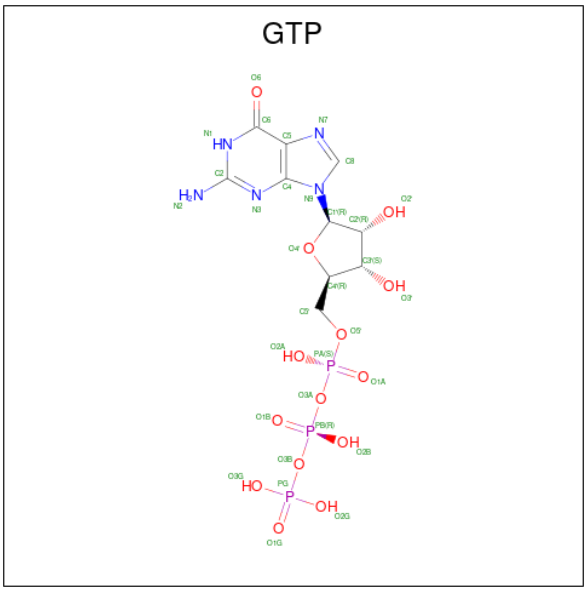
- Molecule 3 is a protein called Exportin-2.

Mol	Chain	Residues	Atoms						AltConf	Trace
3	B	528	Total	C	H	N	O	S	0	0
			8528	2736	4249	720	807	16		

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-8	GLY	-	expression tag	UNP P55060
B	-7	GLY	-	expression tag	UNP P55060
B	-6	SER	-	expression tag	UNP P55060
B	-5	PRO	-	expression tag	UNP P55060
B	-4	ARG	-	expression tag	UNP P55060
B	-3	ASP	-	expression tag	UNP P55060
B	-2	PRO	-	expression tag	UNP P55060
B	-1	ILE	-	expression tag	UNP P55060
B	0	ALA	-	expression tag	UNP P55060

- Molecule 4 is GUANOSINE-5'-TRIPHOSPHATE (CCD ID: GTP) (formula: $C_{10}H_{16}N_5O_{14}P_3$) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						AltConf
4	C	1	Total	C	H	N	O	P	0
			44	10	12	5	14	3	

- Molecule 5 is MAGNESIUM ION (CCD ID: MG) (formula: Mg) (labeled as "Ligand of Interest" by depositor).

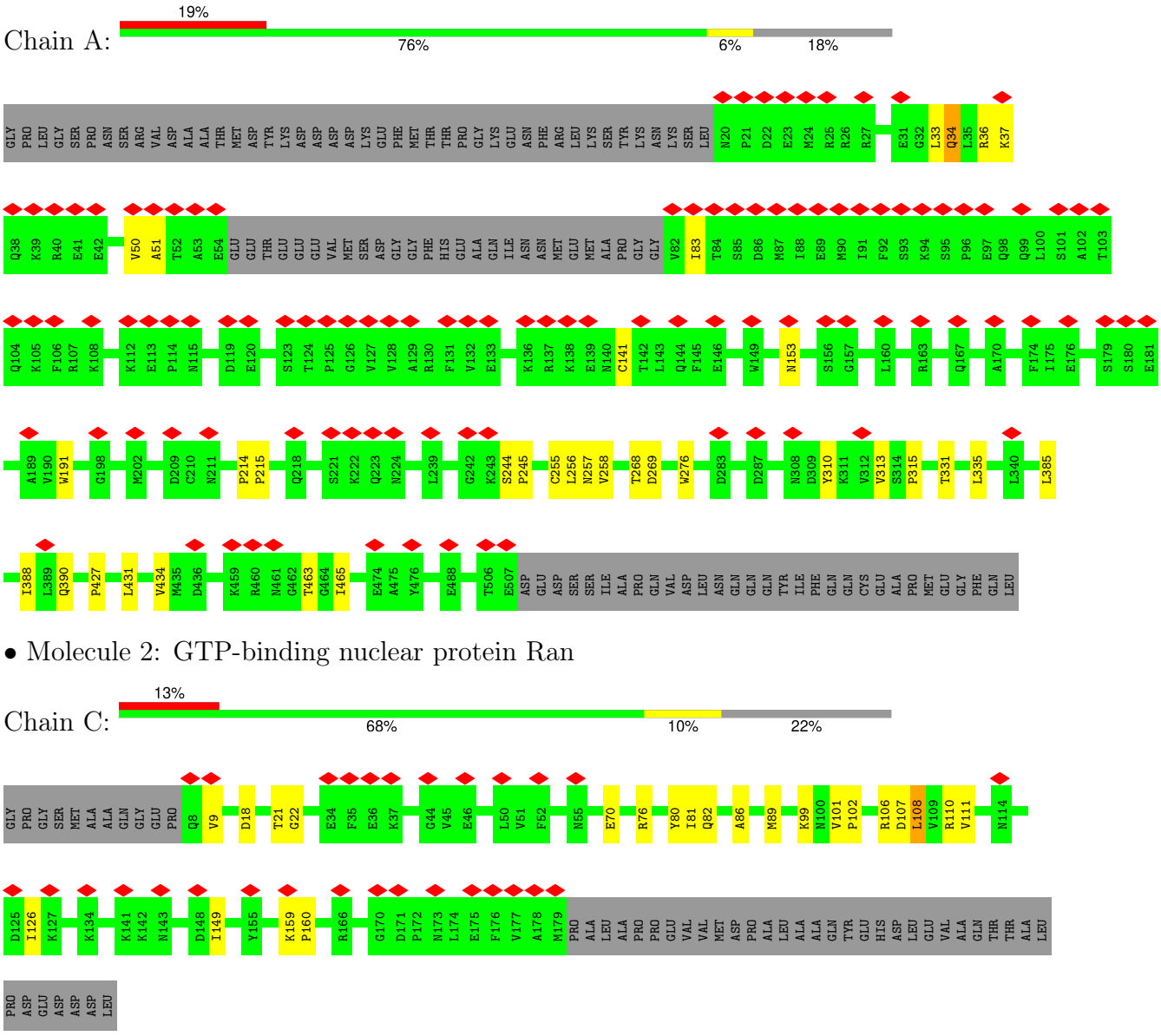
Mol	Chain	Residues	Atoms		AltConf
5	C	1	Total	Mg	0
			1	1	

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: Importin subunit alpha-5

Chain A:



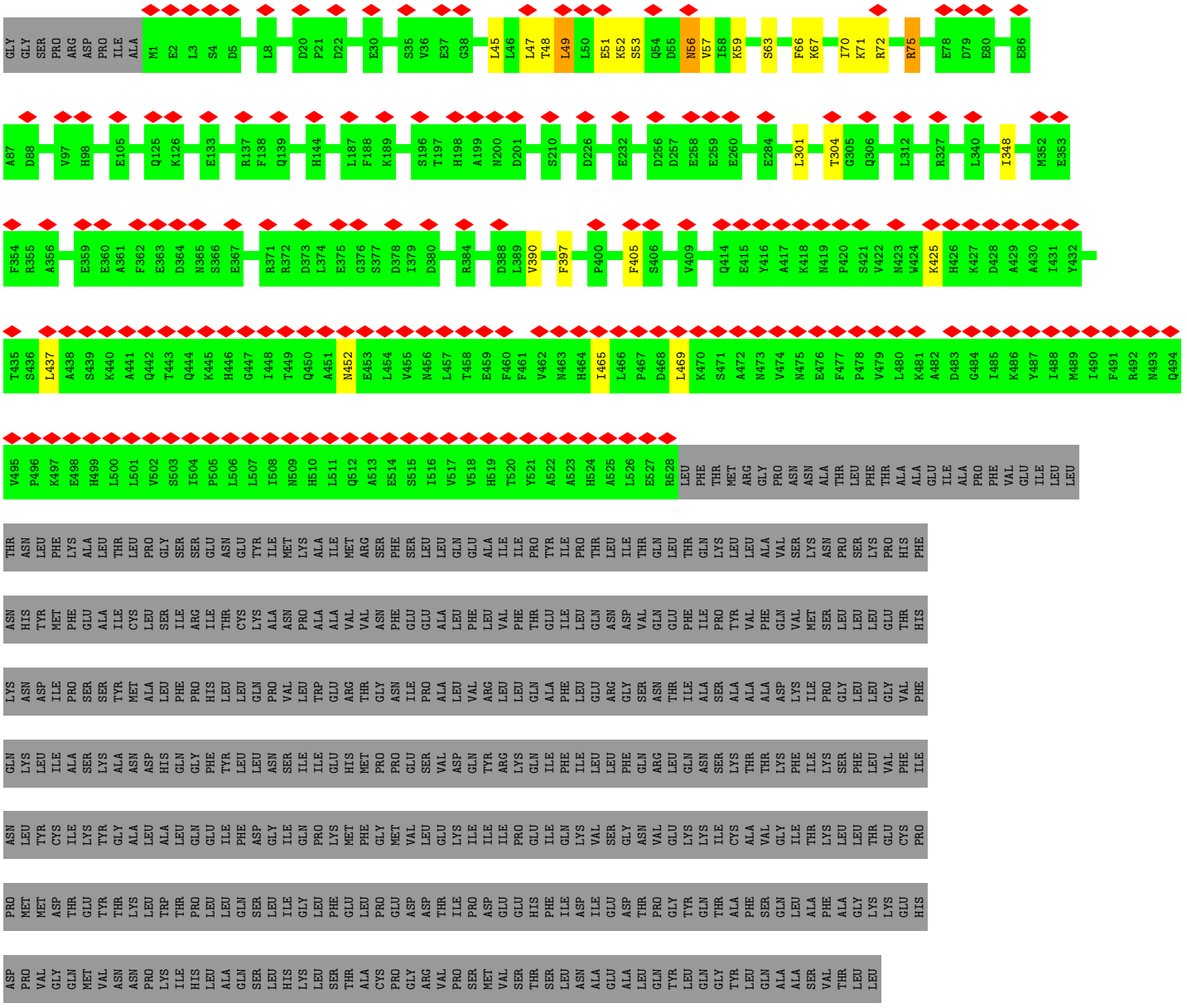
• Molecule 2: GTP-binding nuclear protein Ran

Chain C:

• Molecule 3: Exportin-2

Chain B:


19%
51%
46%


GLY GLY SER PRO ARG ASP PRO ILE ALA M1 E2 L3 S4 D5 L8 D20 P21 D22 E30 S35 V36 E37 G38 L45 L46 L47 T48 L49 L50 E51 K52 S53 Q54 D55 N56 V57 I58 K59 S63 F66 K67 I70 K71 R72 R75 E78 D79 E80 E86
A87 D88 V97 H98 E105 Q125 K126 E133 R137 F138 Q139 H144 L187 F188 K189 S196 T197 H198 A199 N200 D201 S210 D226 E232 D256 D257 E258 E259 E260 E284 L301 T304 G305 Q306 L312 R327 L340 I348 M352 E353
F354 R355 A356 E359 E360 A361 F362 E363 D364 N365 S366 E367 R371 R372 D373 L374 E375 G376 S377 D378 I379 D380 R384 D388 L389 V390 F397 P400 F405 S406 V409 Q414 E415 Y416 A417 K418 N419 P420 S421 V422 N423 W424 K425 H426 K427 D428 A429 A430 I431 Y432
T435 S436 L437 A438 S439 K440 A441 Q442 T443 Q444 K445 H446 G447 I448 T449 Q450 A451 N452 E453 L454 V455 N456 L457 T458 E459 F460 F461 V462 N463 H464 I465 L466 P467 D468 L469 K470 S471 A472 N473 V474 N475 E476 F477 P478 V479 L480 K481 A482 D483 G484 I485 K486 Y487 I488 M489 I490 F491 R492 N493 Q494
V495 P496 K497 E498 H499 L500 L501 V502 S503 I504 P505 L506 L507 I508 N509 H510 L511 Q512 A513 E514 S515 I516 V517 V518 H519 T520 Y521 A522 A523 H524 A525 L526 E527 R528 LEU PHE THR MET ARG GLY PRO ASN ASN ALA THR LEU PHE THR ALA ALA GLU ILE ALA PRO PHE VAL GLU ILE LEU LEU
THR ASN LEU PHE LYS ALA LEU THR LEU PRO GLY SER SER GLU ASN GLU TYR ILE MET LYS ALA ILE MET ARG SER PHE SER LEU LEU GLN GLU ALA ILE ILE PRO TYR ILE PRO THR LEU ILE THR GLN LEU GLN LYS LEU LEU ALA VAL SER LYS ASN PRO SER LYS PRO HIS PHE
ASN HIS TYR MET PHE GLU ALA ILE CYS LEU SER ILE ARG ILE THR CYS LYS ALA ASN PRO ALA ALA VAL VAL ASN PHE GLU GLU ALA LEU PHE LEU VAL PHE THR GLU ILE LEU GLN ASN ASP VAL GLN GLU PHE ILE PRO TYR VAL PHE GLN VAL MET SER LEU LEU LEU GLU THR HIS
LYS ASN ASP ILE PRO SER SER TYR MET ALA LEU PHE PRO HIS LEU LEU GLN PRO VAL LEU TRP GLU ARG THR GLY ASN ILE PRO ALA LEU VAL ARG LEU LEU GLN ALA PHE LEU GLU ARG GLY SER ASN THR ILE ALA SER ALA ALA ASP LYS ILE PRO GLY LEU LEU GLY VAL PHE
GLN LYS LEU ILE ALA SER LYS ALA ASN ASP HIS GLN GLY PHE TYR LEU LEU ASN SER ILE ILE GLU HIS MET PRO PRO GLU SER VAL ASP GLN TYR ARG LYS GLN ILE PHE ILE LEU LEU LEU PHE GLN ARG LEU GLN ASN SER LYS THR THR LYS PHE ILE LYS SER PHE LEU VAL PHE ILE
ASN LEU TYR CYS ILE LYS TYR GLY ALA LEU ALA LEU GLN GLU ILE PHE ASP GLY ILE GLN PRO LYS MET PHE GLY MET VAL LEU GLU LYS ILE ILE PRO GLU GLU ILE LYS VAL SER GLY ASN VAL GLU LYS LYS ILE CYS ALA VAL GLY ILE THR LYS LEU LEU THR GLU CYS PRO
PRO MET MET ASP THR GLU TYR THR LYS LEU PRO LEU LEU GLN SER LEU ILE GLY LEU PHE GLU LEU PRO GLU ASP ASP THR ILE PRO ASP GLU GLU HIS PHE ILE ASP ILE GLU ASP THR PRO GLY TYR GLN THR ALA PHE SER GLN LEU ALA PHE SER ALA LYS LYS GLU HIS
ASP PRO VAL GLY GLN MET VAL ASN ASN PRO LYS ILE HIS LEU ALA GLN SER LEU HIS LYS LEU SER THR ALA CYS PRO GLY ARG VAL PRO SER MET VAL SER THR SER LEU ASN ALA GLU ALA LEU GLN TYR LEU GLN GLY TYR LEU GLN ALA ALA SER VAL THR LEU LEU

4 Experimental information (i)

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	286636	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	TFS KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/Å^2$)	50	Depositor
Minimum defocus (nm)	500	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	105000	Depositor
Image detector	GATAN K3 BIOQUANTUM (6k x 4k)	Depositor
Maximum map value	0.227	Depositor
Minimum map value	-0.105	Depositor
Average map value	-0.000	Depositor
Map value standard deviation	0.004	Depositor
Recommended contour level	0.05	Depositor
Map size (Å)	307.80002, 307.80002, 307.80002	wwPDB
Map dimensions	360, 360, 360	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.8550001, 0.8550001, 0.8550001	Depositor

5 Model quality

5.1 Standard geometry

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

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	A	0.11	0/3665	0.27	0/4970
2	C	0.13	0/1432	0.32	0/1933
3	B	0.14	0/4367	0.29	0/5922
All	All	0.13	0/9464	0.29	0/12825

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3606	3645	3643	19	0
2	C	1398	1422	1427	13	0
3	B	4279	4249	4265	13	0
4	C	32	12	12	1	0
5	C	1	0	0	0	0
All	All	9316	9328	9347	43	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 2.

All (43) 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:C:81:ILE:HG21	3:B:57:VAL:HG13	1.90	0.54
1:A:463:THR:HG22	1:A:465:ILE:HG22	1.90	0.53
3:B:75:ARG:HG2	3:B:75:ARG:HH11	1.74	0.53
2:C:22:GLY:HA3	4:C:301:GTP:H8	1.76	0.51
1:A:255:CYS:O	1:A:258:VAL:HG22	2.13	0.49
1:A:33:LEU:O	1:A:34:GLN:O	2.30	0.49
1:A:310:TYR:HA	1:A:313:VAL:HG12	1.95	0.49
2:C:18:ASP:H	2:C:21:THR:HG21	1.79	0.47
3:B:45:LEU:O	3:B:49:LEU:HD12	2.14	0.47
1:A:276:TRP:CD2	1:A:315:PRO:HB3	2.50	0.46
3:B:49:LEU:C	3:B:49:LEU:HD22	2.40	0.46
1:A:390:GLN:HG2	1:A:427:PRO:HB3	1.97	0.46
3:B:405:PHE:CD2	3:B:437:LEU:HD11	2.51	0.46
2:C:18:ASP:O	2:C:21:THR:HG23	2.16	0.45
1:A:431:LEU:O	1:A:434:VAL:HG22	2.17	0.45
2:C:82:GLN:OE1	3:B:57:VAL:HG21	2.17	0.45
1:A:36:ARG:O	1:A:37:LYS:HB3	2.17	0.45
2:C:86:ALA:HB1	2:C:108:LEU:HD11	1.98	0.44
3:B:45:LEU:HA	3:B:48:THR:OG1	2.17	0.44
1:A:244:SER:O	1:A:245:PRO:C	2.61	0.44
2:C:89:MET:SD	2:C:149:ILE:HD11	2.58	0.44
2:C:101:VAL:HB	2:C:102:PRO:HD3	2.00	0.44
3:B:56:ASN:HA	3:B:59:LYS:HD3	1.99	0.43
1:A:331:THR:HG22	1:A:335:LEU:HD13	2.00	0.43
2:C:106:ARG:HE	2:C:110:ARG:HH11	1.67	0.42
1:A:385:LEU:HA	1:A:388:ILE:HG22	2.02	0.42
2:C:159:LYS:N	2:C:160:PRO:CD	2.83	0.42
3:B:301:LEU:O	3:B:304:THR:HG22	2.19	0.41
1:A:36:ARG:O	1:A:37:LYS:CB	2.68	0.41
1:A:255:CYS:SG	1:A:256:LEU:N	2.94	0.41
1:A:268:THR:HG23	1:A:269:ASP:N	2.36	0.41
2:C:107:ASP:O	2:C:110:ARG:HG2	2.20	0.41
3:B:348:ILE:HD13	3:B:390:VAL:HG22	2.02	0.41
3:B:465:ILE:HG22	3:B:469:LEU:HD12	2.01	0.41
1:A:50:VAL:HG12	1:A:51:ALA:N	2.36	0.41
1:A:51:ALA:HB3	1:A:191:TRP:CH2	2.56	0.41
2:C:80:TYR:HB2	2:C:111:VAL:HG11	2.03	0.40
3:B:348:ILE:HD13	3:B:390:VAL:CG2	2.51	0.40
2:C:126:ILE:HG22	2:C:126:ILE:O	2.21	0.40
1:A:83:ILE:HD12	1:A:83:ILE:N	2.37	0.40
1:A:465:ILE:O	1:A:465:ILE:HG23	2.21	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:66:PHE:O	3:B:70:ILE:HG12	2.21	0.40
1:A:214:PRO:N	1:A:215:PRO:HD2	2.36	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	457/563 (81%)	429 (94%)	27 (6%)	1 (0%)	43 73
2	C	170/220 (77%)	158 (93%)	10 (6%)	2 (1%)	10 42
3	B	526/980 (54%)	497 (94%)	28 (5%)	1 (0%)	43 73
All	All	1153/1763 (65%)	1084 (94%)	65 (6%)	4 (0%)	37 68

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	34	GLN
3	B	452	ASN
2	C	76	ARG
2	C	9	VAL

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	399/490 (81%)	396 (99%)	3 (1%)	73	82
2	C	151/187 (81%)	148 (98%)	3 (2%)	48	72
3	B	476/873 (54%)	463 (97%)	13 (3%)	39	68
All	All	1026/1550 (66%)	1007 (98%)	19 (2%)	49	73

All (19) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	141	CYS
1	A	153	ASN
1	A	257	ASN
2	C	70	GLU
2	C	99	LYS
2	C	108	LEU
3	B	47	LEU
3	B	49	LEU
3	B	51	GLU
3	B	52	LYS
3	B	53	SER
3	B	56	ASN
3	B	63	SER
3	B	67	LYS
3	B	71	LYS
3	B	72	ARG
3	B	75	ARG
3	B	397	PHE
3	B	425	LYS

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

Mol	Chain	Res	Type
1	A	461	ASN
2	C	62	ASN
2	C	105	HIS
3	B	106	GLN
3	B	125	GLN
3	B	162	HIS
3	B	198	HIS
3	B	223	ASN
3	B	234	ASN

5.3.3 RNA

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 2 ligands modelled in this entry, 1 is monoatomic - leaving 1 for Mogul analysis.

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	$\#\|Z\| > 2$
4	GTP	C	301	5	33,34,34	0.91	1 (3%)	50,54,54	0.96	4 (8%)

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
4	GTP	C	301	5	-	5/22/38/38	0/3/3/3

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	C	301	GTP	PA-O3A	2.48	1.62	1.59

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
4	C	301	GTP	O3G-PG-O2G	-2.67	97.80	107.80
4	C	301	GTP	O2A-PA-O3A	-2.30	101.04	107.27
4	C	301	GTP	O2G-PG-O1G	2.08	118.96	110.83
4	C	301	GTP	O3G-PG-O1G	2.08	118.94	110.83

There are no chirality outliers.

All (5) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	301	GTP	C5'-O5'-PA-O3A
4	C	301	GTP	C5'-O5'-PA-O1A
4	C	301	GTP	C5'-O5'-PA-O2A
4	C	301	GTP	PA-O3A-PB-O1B
4	C	301	GTP	PA-O3A-PB-O2B

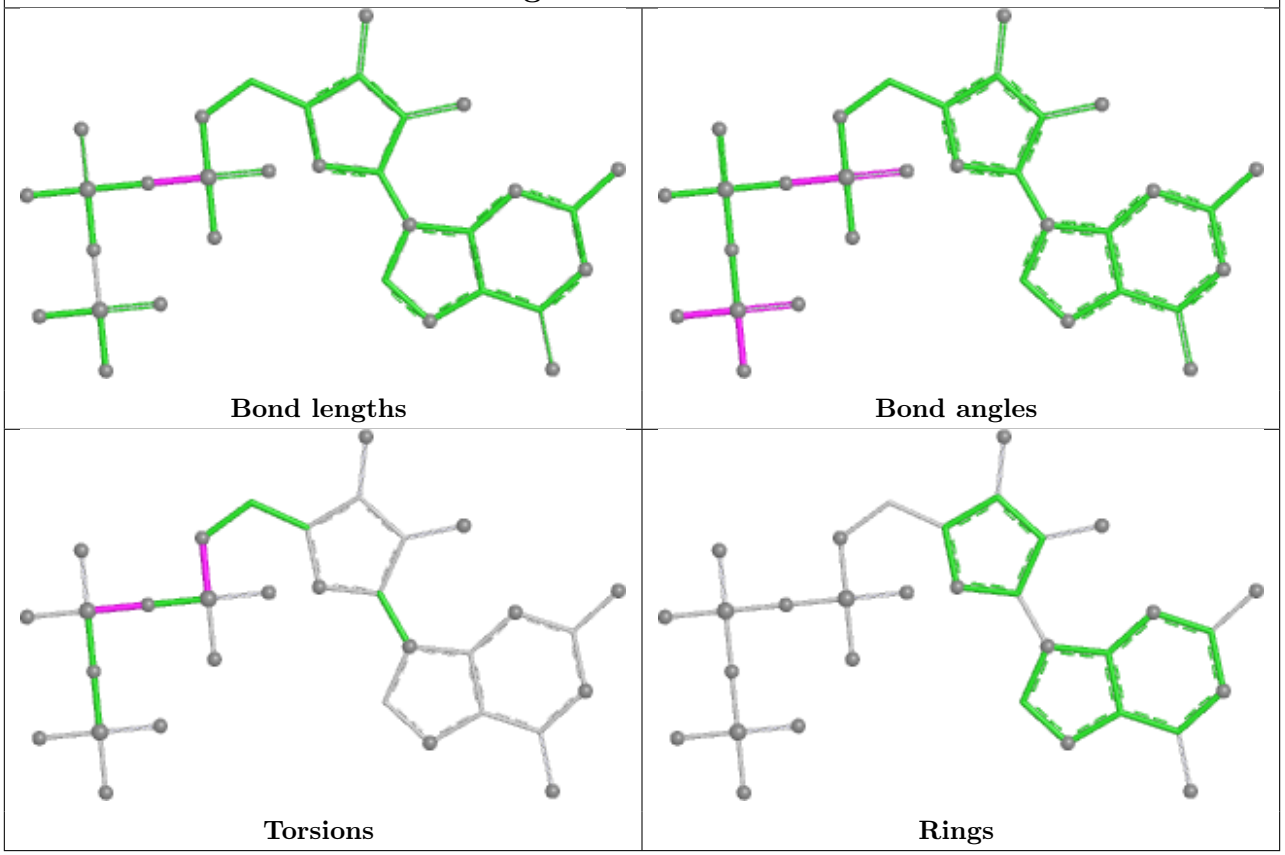
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	C	301	GTP	1	0

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

Ligand GTP C 301



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.

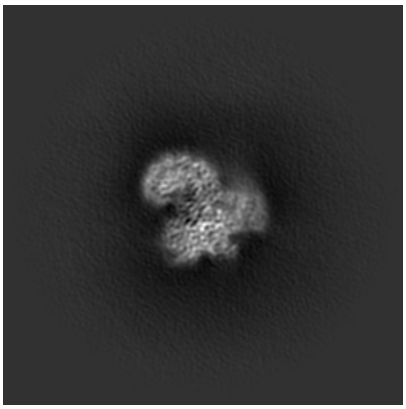
6 Map visualisation

This section contains visualisations of the EMDB entry EMD-75922. These allow visual inspection of the internal detail of the map and identification of artifacts.

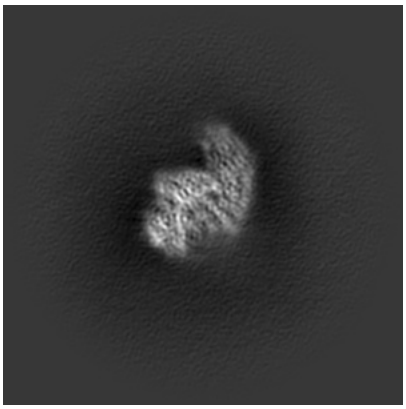
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections

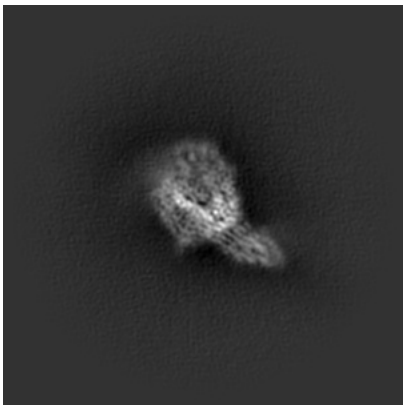
6.1.1 Primary map



X

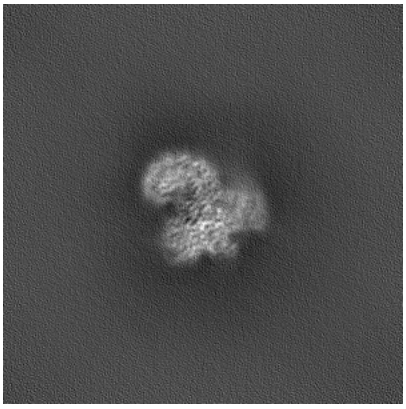


Y

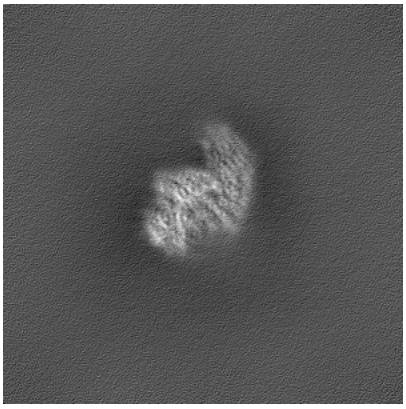


Z

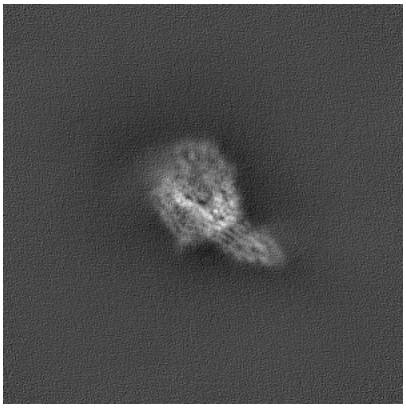
6.1.2 Raw map



X



Y

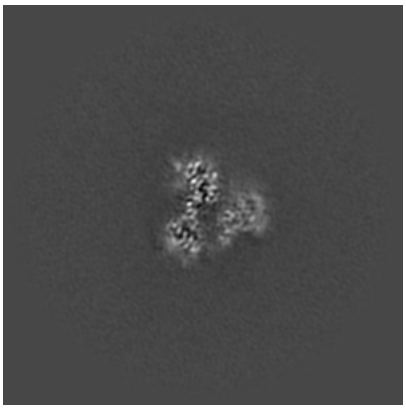


Z

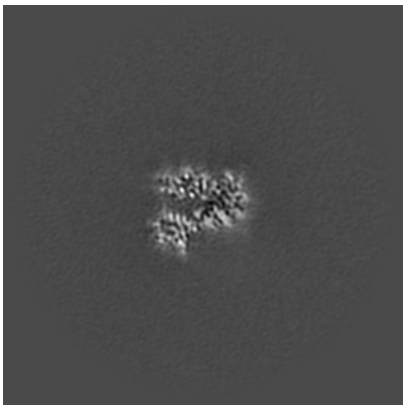
The images above show the map projected in three orthogonal directions.

6.2 Central slices (i)

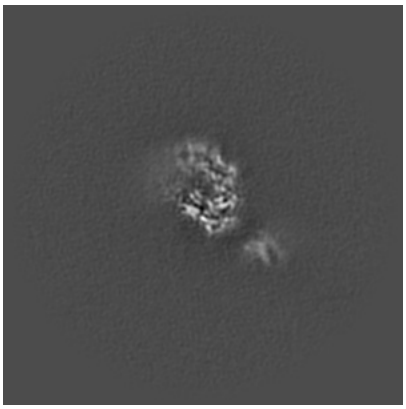
6.2.1 Primary map



X Index: 180

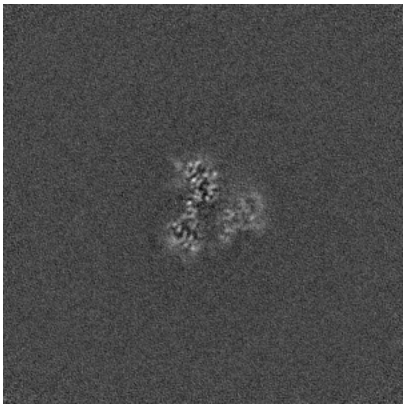


Y Index: 180

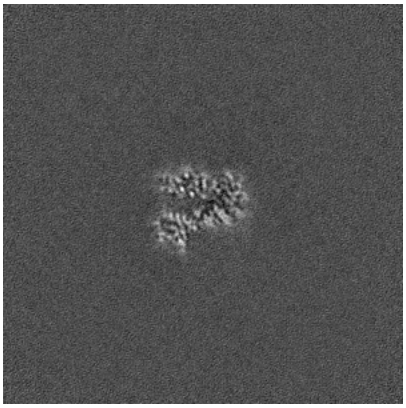


Z Index: 180

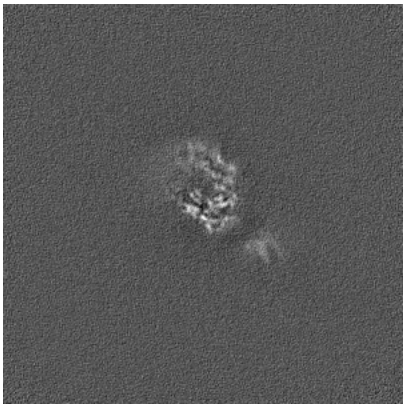
6.2.2 Raw map



X Index: 180



Y Index: 180

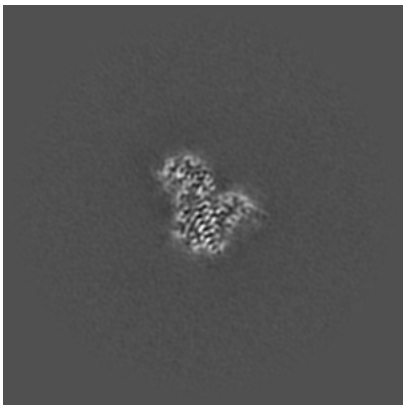


Z Index: 180

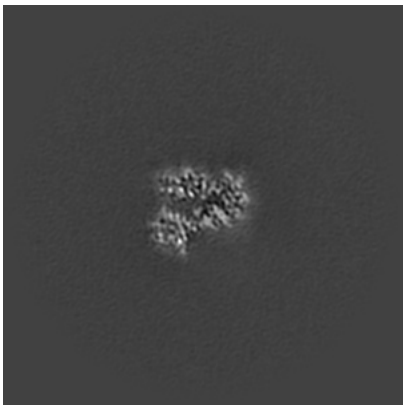
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices (i)

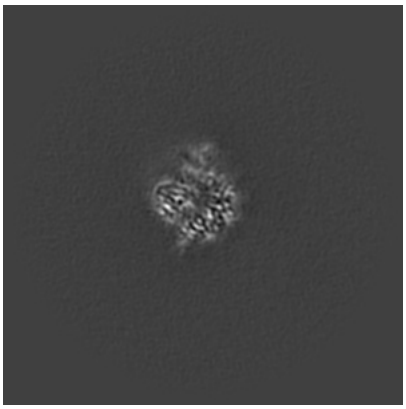
6.3.1 Primary map



X Index: 194

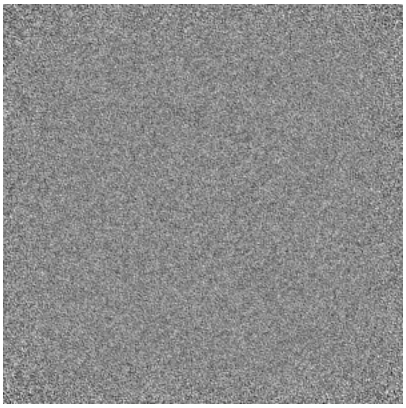


Y Index: 179

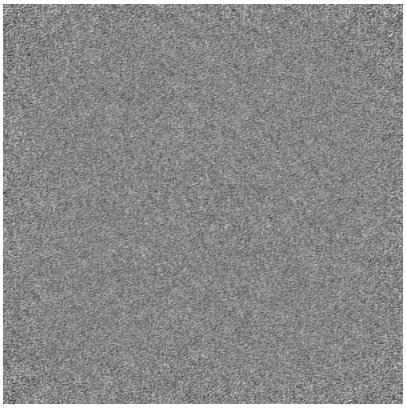


Z Index: 158

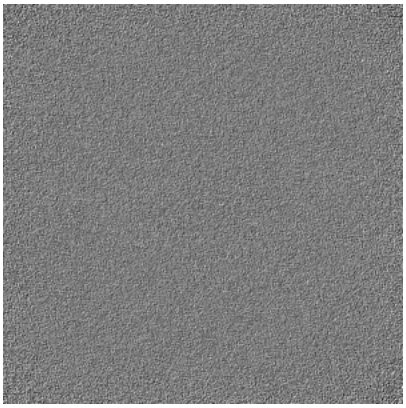
6.3.2 Raw map



X Index: 0



Y Index: 0

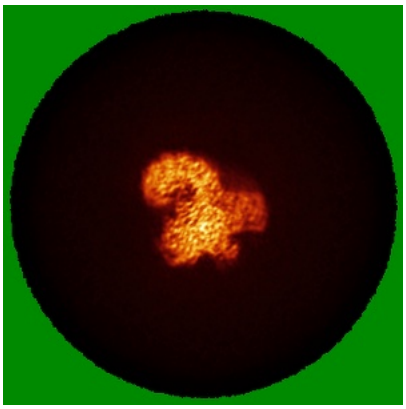


Z Index: 0

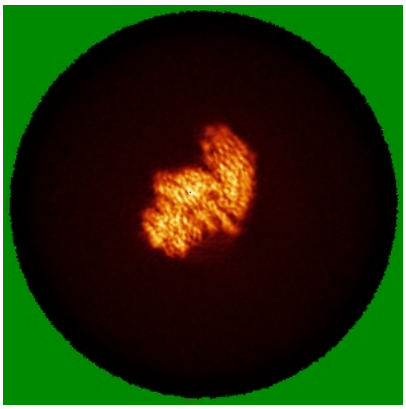
The images above show the largest variance slices of the map in three orthogonal directions.

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

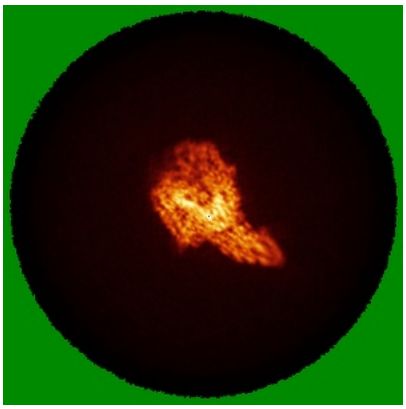
6.4.1 Primary map



X

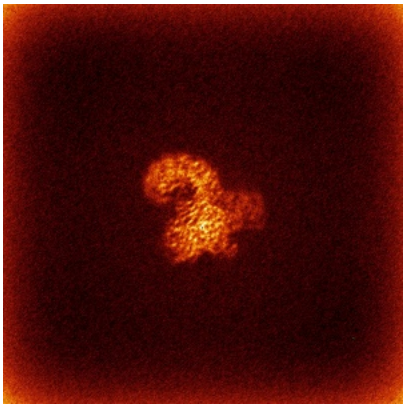


Y

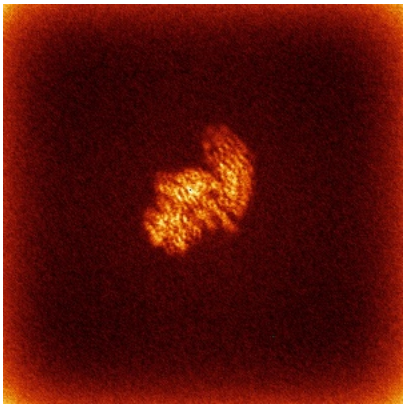


Z

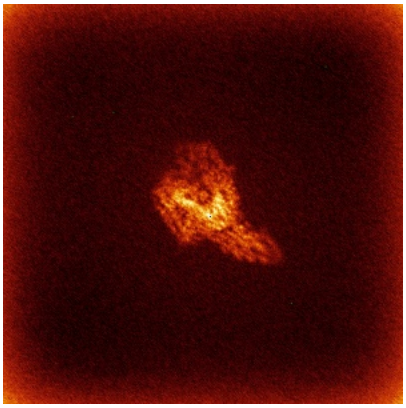
6.4.2 Raw map



X



Y

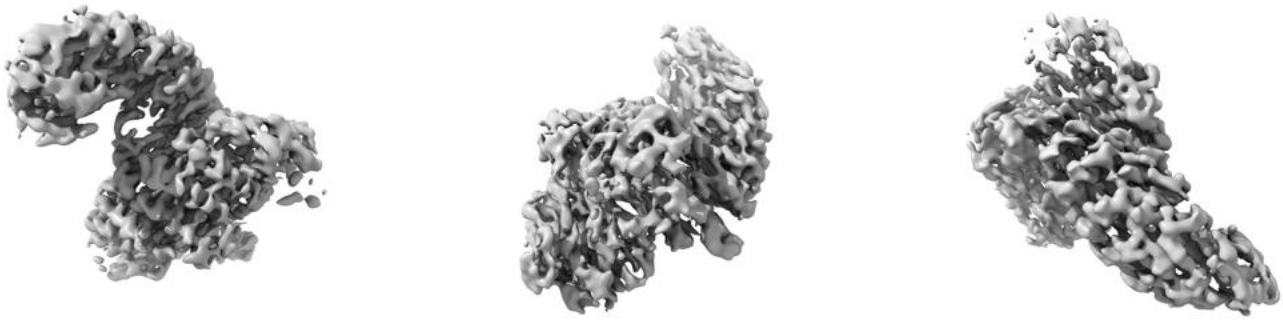


Z

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 0.05. 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.

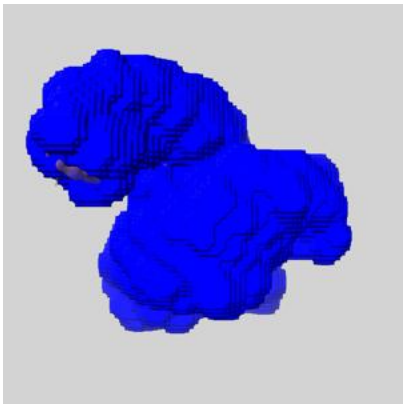
6.6 Mask visualisation (i)

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

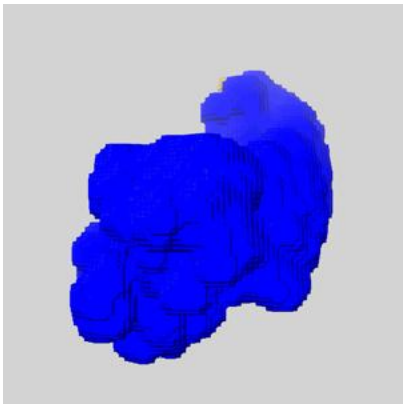
A mask typically either:

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

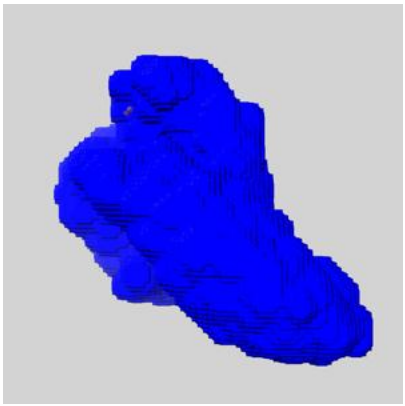
6.6.1 emd_75922_msk_1.map (i)



X



Y

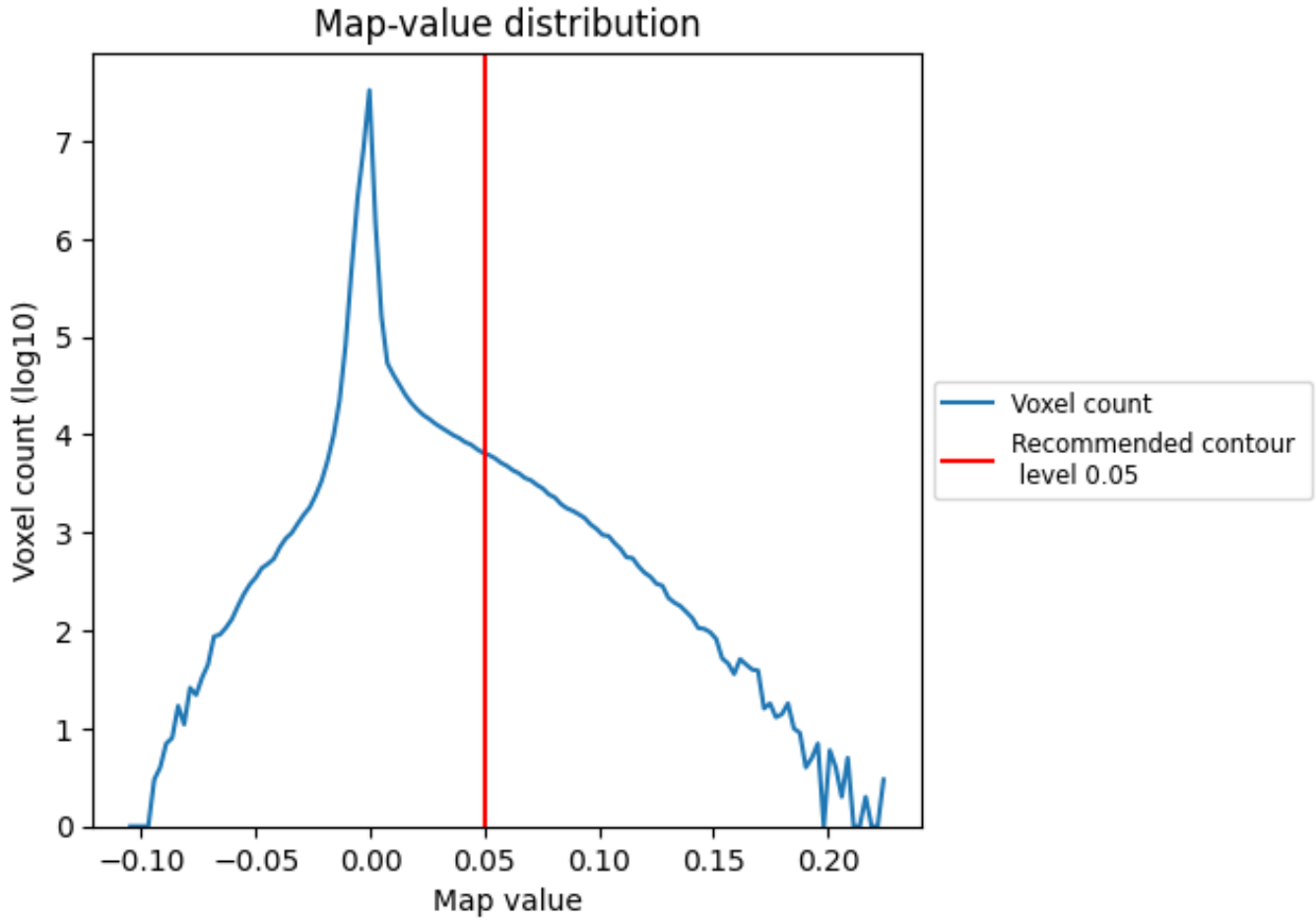


Z

7 Map analysis

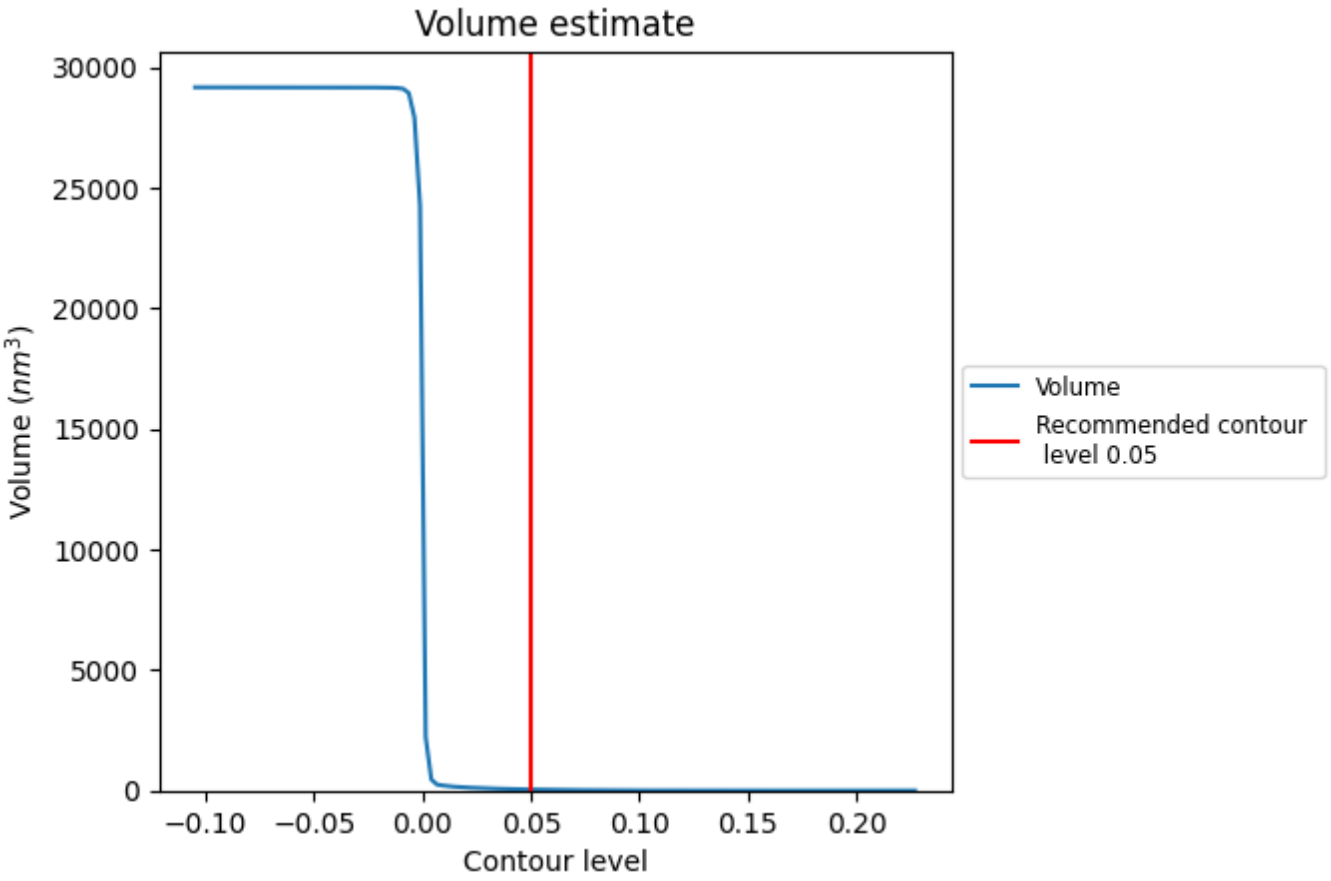
This section contains the results of statistical analysis of the map.

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.

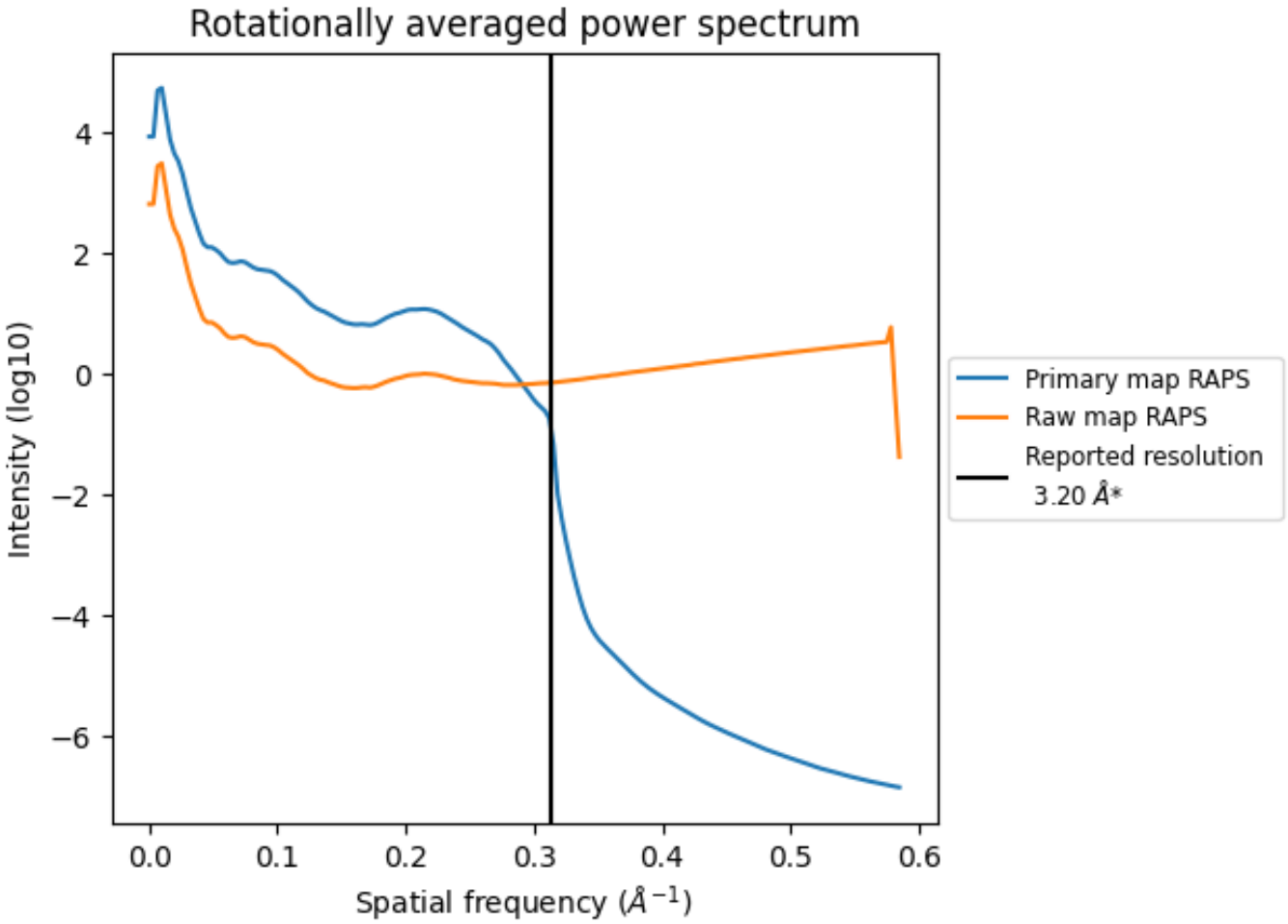
7.2 Volume estimate



The volume at the recommended contour level is 45 nm^3; this corresponds to an approximate mass of 40 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)

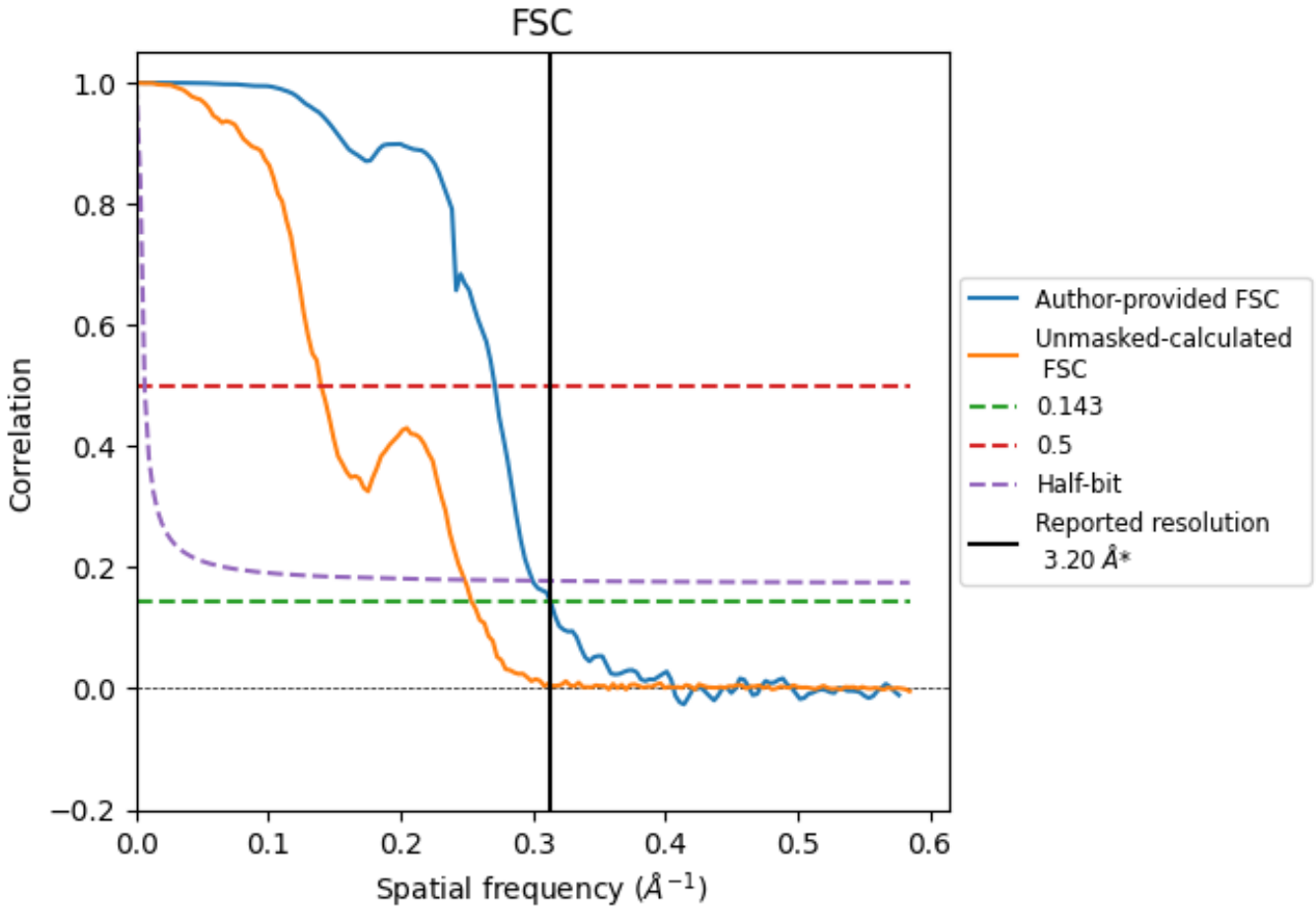


*Reported resolution corresponds to spatial frequency of 0.312 Å^{-1}

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 0.312 Å^{-1}

8.2 Resolution estimates (i)

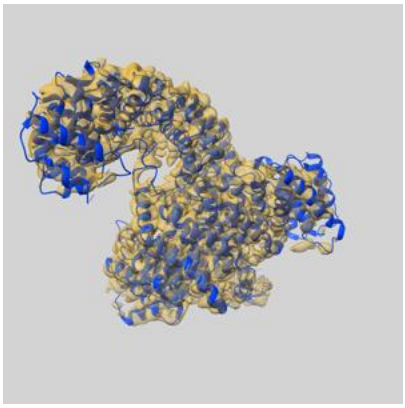
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.20	-	-
Author-provided FSC curve	3.19	3.69	3.33
Unmasked-calculated*	3.94	7.15	4.03

*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 3.94 differs from the reported value 3.2 by more than 10 %

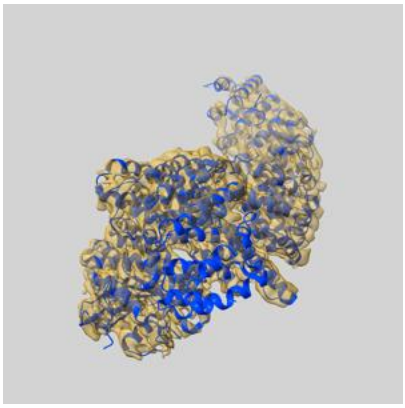
9 Map-model fit

This section contains information regarding the fit between EMDB map EMD-75922 and PDB model 11PH. Per-residue inclusion information can be found in section 3 on page 6.

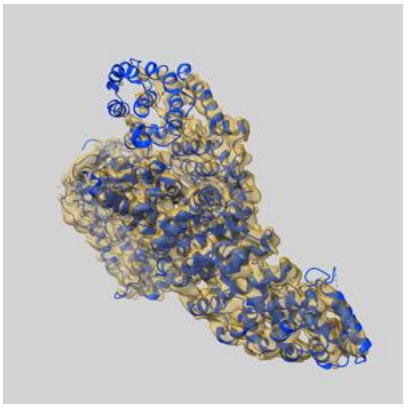
9.1 Map-model overlay



X



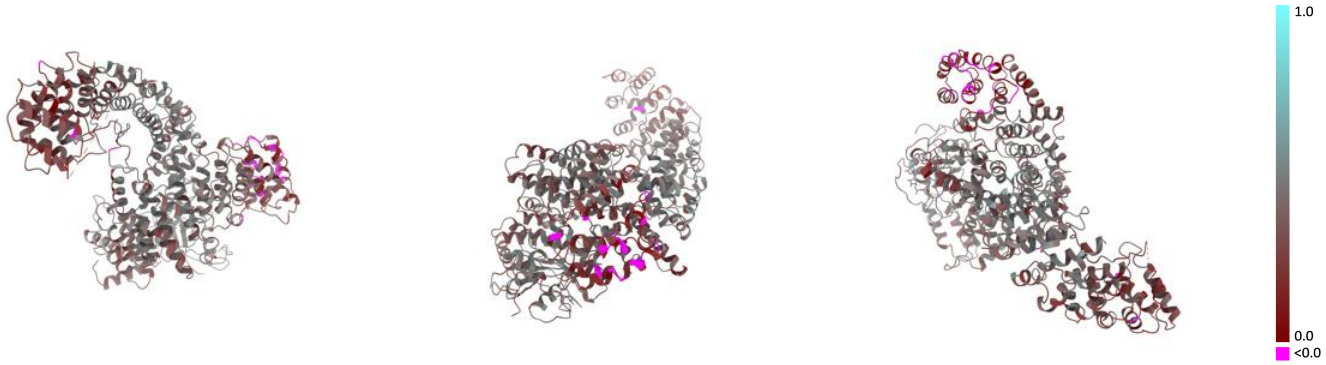
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.05 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.

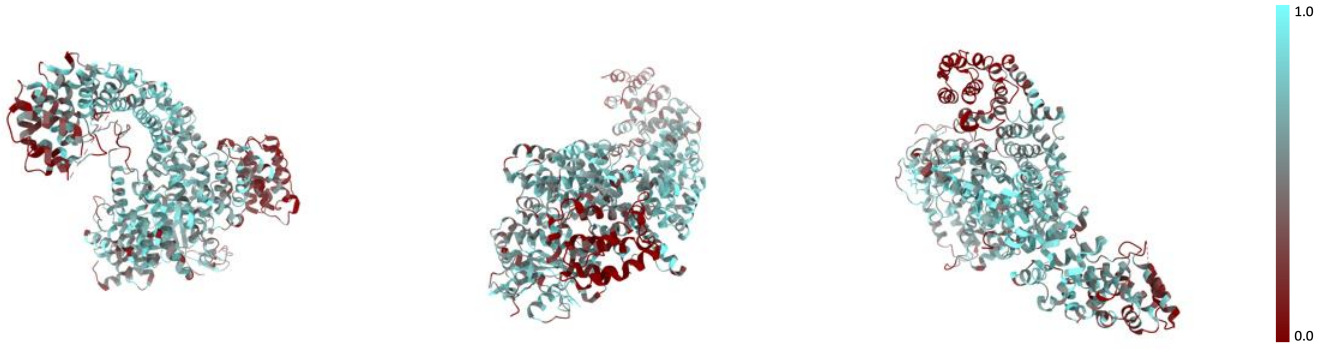
9.2 Q-score mapped to coordinate model



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.

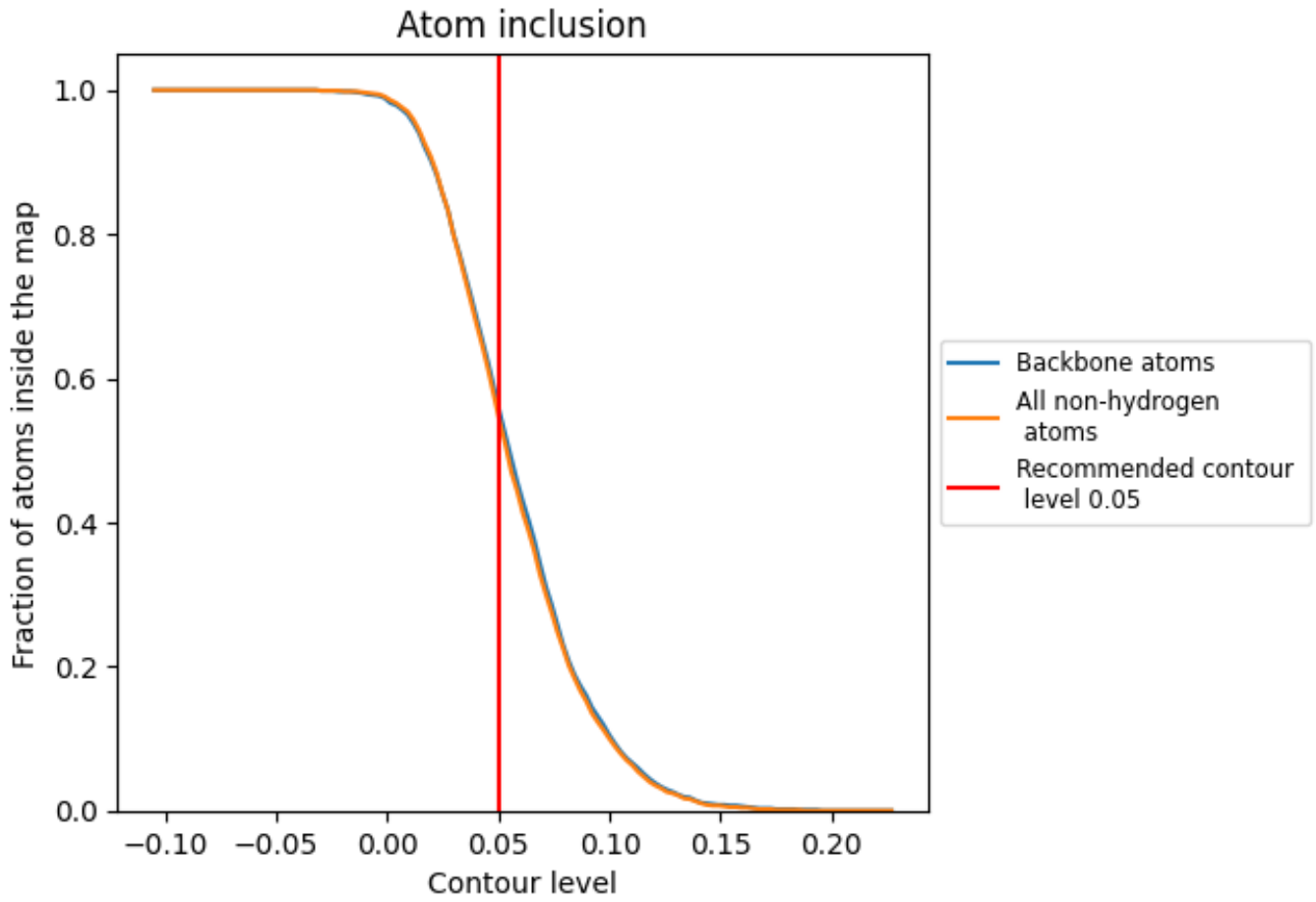
9.3 Atom inclusion mapped to coordinate model



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 (0.05).

9.4 Atom inclusion (i)



At the recommended contour level, 56% of all backbone atoms, 55% 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 (0.05) and Q-score for the entire model and for each chain.



Chain	Atom inclusion	Q-score
All	0.5480	0.3670
A	0.5880	0.3740
B	0.4930	0.3400
C	0.6280	0.4290