



# Full wwPDB EM Validation Report ⓘ

Oct 5, 2024 – 04:43 PM EDT

PDB ID : 5UZ7  
EMDB ID : EMD-8623  
Title : Volta phase plate cryo-electron microscopy structure of a calcitonin receptor-heterotrimeric Gs protein complex  
Authors : Liang, Y.L.; Khoshouei, M.; Radjainia, M.; Zhang, Y.; Glukhova, A.; Tarrasch, J.; Thal, D.M.; Furness, S.G.B.; Christopoulos, G.; Coudrat, T.; Danev, R.; Baumeister, W.; Miller, L.J.; Christopoulos, A.; Kobilka, B.K.; Wootten, D.; Skiniotis, G.; Sexton, P.M.  
Deposited on : 2017-02-24  
Resolution : 4.10 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>.

---

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

EMDB validation analysis : 0.0.1.dev113  
MolProbity : 4.02b-467  
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

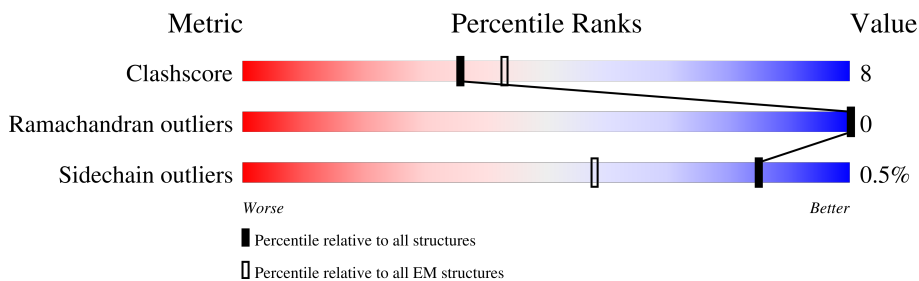
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.10 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	380	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: right;">7%</div> <div style="width: 100%; height: 15px; background: linear-gradient(to right, red 7%, orange 7%, yellow 8%, green 41%, grey 51%);"></div> <div style="text-align: left;">41% 8% 51%</div> </div>
2	B	351	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: right;">7%</div> <div style="width: 100%; height: 15px; background: linear-gradient(to right, red 7%, orange 7%, yellow 75%, green 21%, grey 21%);"></div> <div style="text-align: left;">75% 21% ..</div> </div>
3	G	68	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: right;">13%</div> <div style="width: 100%; height: 15px; background: linear-gradient(to right, red 13%, orange 13%, yellow 76%, green 19%, grey 19%);"></div> <div style="text-align: left;">76% . 19%</div> </div>
4	N	138	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: right;">5%</div> <div style="width: 100%; height: 15px; background: linear-gradient(to right, red 5%, orange 5%, yellow 72%, green 21%, grey 7%);"></div> <div style="text-align: left;">72% 21% 7%</div> </div>
5	R	501	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: right;">19%</div> <div style="width: 100%; height: 15px; background: linear-gradient(to right, red 19%, orange 19%, yellow 40%, green 13%, grey 47%);"></div> <div style="text-align: left;">40% 13% 47%</div> </div>

## 2 Entry composition i

There are 5 unique types of molecules in this entry. The entry contains 7643 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 Guanine nucleotide-binding protein G(s) subunit alpha isoforms short.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	185	1566	997	287	276	6	0	0

- Molecule 2 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	340	2579	1593	462	504	20	0	0

There are 12 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-10	MET	-	expression tag	UNP P62873
B	-9	HIS	-	expression tag	UNP P62873
B	-8	HIS	-	expression tag	UNP P62873
B	-7	HIS	-	expression tag	UNP P62873
B	-6	HIS	-	expression tag	UNP P62873
B	-5	HIS	-	expression tag	UNP P62873
B	-4	HIS	-	expression tag	UNP P62873
B	-3	GLY	-	expression tag	UNP P62873
B	-2	SER	-	expression tag	UNP P62873
B	-1	LEU	-	expression tag	UNP P62873
B	0	LEU	-	expression tag	UNP P62873
B	1	GLN	-	expression tag	UNP P62873

- Molecule 3 is a protein called Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	G	55	420	263	74	80	3	0	0

- Molecule 4 is a protein called NANOBODY 35.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
4	N	128	972	605	170	191	6	0	0

- Molecule 5 is a protein called Calcitonin receptor.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
5	R	266	2106	1419	341	328	18	0	0

There are 52 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
R	-7	MET	-	initiating methionine	UNP P30988
R	-6	LYS	-	expression tag	UNP P30988
R	-5	THR	-	expression tag	UNP P30988
R	-4	ILE	-	expression tag	UNP P30988
R	-3	ILE	-	expression tag	UNP P30988
R	-2	ALA	-	expression tag	UNP P30988
R	-1	LEU	-	expression tag	UNP P30988
R	0	SER	-	expression tag	UNP P30988
R	1	TYR	-	expression tag	UNP P30988
R	2	ILE	-	expression tag	UNP P30988
R	3	PHE	-	expression tag	UNP P30988
R	4	CYS	-	expression tag	UNP P30988
R	5	LEU	-	expression tag	UNP P30988
R	6	VAL	-	expression tag	UNP P30988
R	7	PHE	-	expression tag	UNP P30988
R	8	ALA	-	expression tag	UNP P30988
R	9	ASP	-	expression tag	UNP P30988
R	10	TYR	-	expression tag	UNP P30988
R	11	LYS	-	expression tag	UNP P30988
R	12	ASP	-	expression tag	UNP P30988
R	13	ASP	-	expression tag	UNP P30988
R	14	ASP	-	expression tag	UNP P30988
R	15	ASP	-	expression tag	UNP P30988
R	16	LEU	-	expression tag	UNP P30988
R	17	GLU	-	expression tag	UNP P30988
R	18	VAL	-	expression tag	UNP P30988
R	19	LEU	-	expression tag	UNP P30988
R	20	PHE	-	expression tag	UNP P30988
R	21	GLN	-	expression tag	UNP P30988

*Continued on next page...*

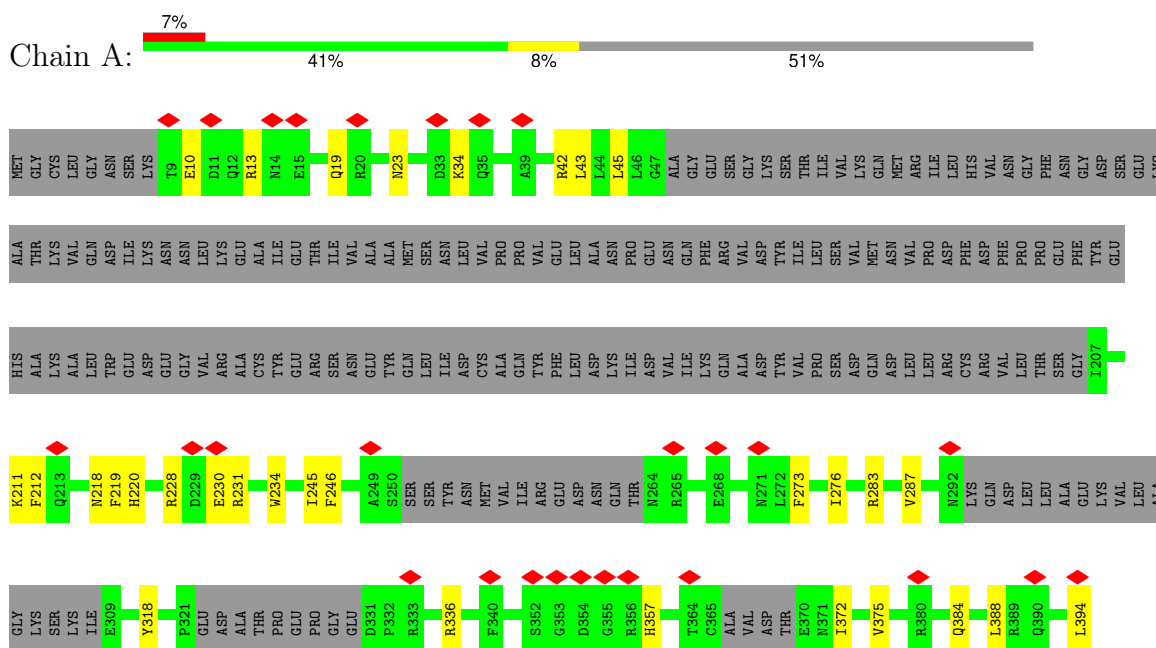
*Continued from previous page...*

Chain	Residue	Modelled	Actual	Comment	Reference
R	22	GLY	-	expression tag	UNP P30988
R	23	PRO	-	expression tag	UNP P30988
R	24	ALA	-	expression tag	UNP P30988
R	447	LEU	PRO	conflict	UNP P30988
R	475	PRO	-	expression tag	UNP P30988
R	476	ALA	-	expression tag	UNP P30988
R	477	GLY	-	expression tag	UNP P30988
R	478	LEU	-	expression tag	UNP P30988
R	479	GLU	-	expression tag	UNP P30988
R	480	VAL	-	expression tag	UNP P30988
R	481	LEU	-	expression tag	UNP P30988
R	482	PHE	-	expression tag	UNP P30988
R	483	GLN	-	expression tag	UNP P30988
R	484	GLY	-	expression tag	UNP P30988
R	485	PRO	-	expression tag	UNP P30988
R	486	HIS	-	expression tag	UNP P30988
R	487	HIS	-	expression tag	UNP P30988
R	488	HIS	-	expression tag	UNP P30988
R	489	HIS	-	expression tag	UNP P30988
R	490	HIS	-	expression tag	UNP P30988
R	491	HIS	-	expression tag	UNP P30988
R	492	HIS	-	expression tag	UNP P30988
R	493	HIS	-	expression tag	UNP P30988

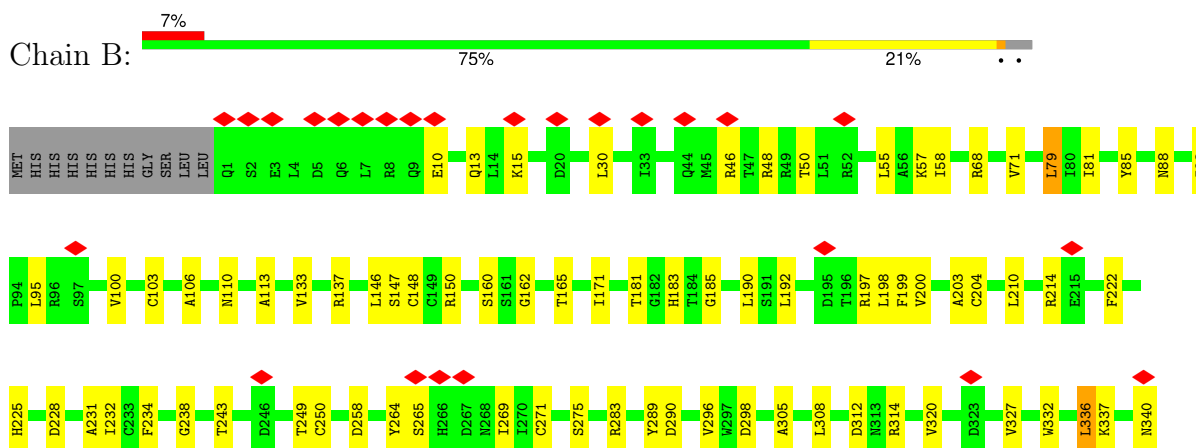
### 3 Residue-property plots [i](#)

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.

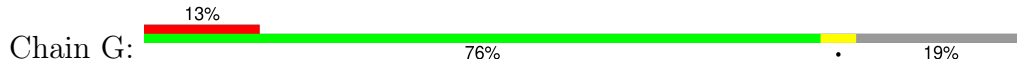
- Molecule 1: Guanine nucleotide-binding protein G(s) subunit alpha isoforms short



- Molecule 2: Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1

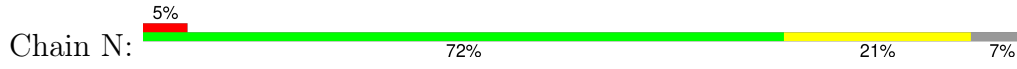


- Molecule 3: Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-2



NET	ALA	SER	ASN	ASN	THR	ALA	S8	I9	A10	Q11	A12	R13	K14	L15	L19	A56	S57	E58	R62	GLU	LYS	LYS	PHE	PHE	CYS
-----	-----	-----	-----	-----	-----	-----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

● Molecule 4: NANOBODY 35



Q1	F29	N35	W36	V37	R38	Q39	A40	K43	G44	L45	E46	W47	D50	I51	S52	S57	I58	F68	T69	I70	S71	R72	D73	K76	N77	Y80	L81	P88	E89	A92	V93	Y94	T104	R105	D106	T111	S112	R118	V126	S127	S128	HIS	HIS	HIS	HIS
----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	-----	-----	-----	-----

● Molecule 5: Calcitonin receptor



NET	LYS	ILE	ILE	ALA	LEU	SER	GLU	TYR	PHE	CYS	VAL	PHE	GLY	ALA	ASP	TYR	LYS	ASP	ASP	ASP	ASP	LEU	GLY	VAL	VAL	PHE	GLN	VAL	GLY	THR	TYR	PRO	THR	THR	THR	ILE	GLU	PRO	LYS	PRO	PHE	LEU	PRO	VAL	VAL	VAL	GLY	ARG	LYS	LYS	VAL	VAL	THR	LYS	TYR	ALA	GLN						
TRP	LYS	TYR	TRP	ARG	MET	GLN	LEU	LEU	PRO	PRO	ALA	TYR	GLN	GLY	GLY	PRO	TYR	ASN	ASP	THR	TRP	ASP	GLU	VAL	VAL	ALA	ALA	ALA	VAL	GLY	VAL	LEU	TYR	TYR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
ASP	GLU	GLY	TRP	PHE	LYS	HIS	PRO	GLU	ASN	ASN	SER	THR	THR	THR	VAL	A136	F137	T138	P139	E140	K141	L142	K143	N144	A145	Y146	Y150	T153	V154	G155	H156	S157	L158	C239	I160	F161	G168	I169	F170	V171	F172	F173	R174	S175	L176	G177	C178	Q179	R180														
V181	T182	K185	L193	M196	I200	H201	L202	V203	E204	V205	VAL	PRO	ASN	GLY	LEU	R213	R214	D215	P216	C219	K220	T221	L222	H223	F224	F225	H226	Q227	Y228	M229	W236	E237	L238	C239	E240	G241	T242	L247	L248	F253	T254	E255	K256	Q257	Y262	L265	C266																
W267	G268	L271	T274	T275	L276	H277	A278	L279	T280	R281	A282	N286	D287	N288	C289	W290	L291	S292	V293	E294	T295	H296	L297	L298	Y299	I300	I301	A308	F313	F314	F315	I319	V322	T325	K326	M327	R328	H331	GLU	ALA	GLU	SER	HIS	M337	Y338	L339	V342	K343	A344														
T345	K346	L347	L348	V349	P350	L351	L352	G353	L354	G355	F356	V357	V358	F359	P360	TRP	ARG	PRO	PRO	GLY	ASN	K366	M367	L368	G369	K370	I371	Y372	H377	S378	L379	I380	H381	F382	F386	V387	A388	T389	I390	Y391	C392	F393	C394	N395	V402	K403	R404	Q405	W406	A407	Q408	F409	K410	I411	Q412	W413							
N414	Q415	R416	W417	G418	ARG	ARG	ARG	PRO	SER	HIS	HIS	HIS	HIS	HIS	ALA	ALA	ALA	ALA	GLY	ASP	ILE	PRO	PRO	TYR	ILE	CYS	HIS	GLN	GLU	LEU	ARG	ASN	PRO	PRO	ALA	ASN	GLN	GLY	GLY	GLU	SER	ALA	ALA	ILE	ILE	PRO	LEU	ASN	ILE	ILE	GLU	GLN	GLU	SER	SER								
ALA	PRO	ALA	GLY	LEU	VAL	PHE	GLN	PRO	ARG	HIS	HIS	HIS	HIS	HIS	HIS	ALA	ALA	ALA	ALA	ALA	GLY	ASP	ILE	PRO	PRO	TYR	ILE	CYS	HIS	GLN	GLU	LEU	ARG	ASN	PRO	PRO	ALA	ASN	GLN	GLY	GLY	GLU	SER	ALA	ALA	ILE	ILE	PRO	LEU	ASN	ILE	ILE	GLU	GLN	GLU	SER	SER						

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	106838	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 ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	0.255	Depositor
Minimum map value	-0.142	Depositor
Average map value	0.000	Depositor
Map value standard deviation	0.008	Depositor
Recommended contour level	0.05	Depositor
Map size (Å)	211.99998, 211.99998, 211.99998	wwPDB
Map dimensions	200, 200, 200	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.06, 1.06, 1.06	Depositor



## 5 Model quality [i](#)

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

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

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.37	0/1596	0.61	1/2142 (0.0%)
2	B	0.43	0/2626	0.69	3/3565 (0.1%)
3	G	0.30	0/426	0.57	0/576
4	N	0.43	0/992	0.65	0/1344
5	R	0.37	1/2166 (0.0%)	0.67	3/2949 (0.1%)
All	All	0.40	1/7806 (0.0%)	0.66	7/10576 (0.1%)

All (1) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
5	R	349	VAL	C-N	5.04	1.43	1.34

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	79	LEU	CA-CB-CG	7.23	131.92	115.30
5	R	142	LEU	CA-CB-CG	7.08	131.60	115.30
1	A	45	LEU	CA-CB-CG	5.96	129.00	115.30
2	B	336	LEU	CA-CB-CG	5.45	127.83	115.30
5	R	265	LEU	CA-CB-CG	5.12	127.08	115.30
5	R	247	LEU	CA-CB-CG	5.08	127.00	115.30
2	B	30	LEU	CA-CB-CG	5.07	126.96	115.30

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	1566	0	1526	18	0
2	B	2579	0	2467	45	0
3	G	420	0	425	2	0
4	N	972	0	935	16	0
5	R	2106	0	2090	40	0
All	All	7643	0	7443	114	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 8.

All (114) 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)
5:R:277:HIS:O	5:R:281:ARG:HB2	1.69	0.91
5:R:388:ALA:O	5:R:392:CYS:HB3	1.75	0.87
5:R:276:ILE:O	5:R:280:THR:HB	1.82	0.79
1:A:211:LYS:HA	1:A:219:PHE:O	1.89	0.73
5:R:387:VAL:O	5:R:391:TYR:HB2	1.90	0.70
5:R:342:VAL:O	5:R:346:MET:HB2	1.93	0.69
5:R:138:THR:O	5:R:142:LEU:HB2	1.97	0.65
1:A:384:GLN:OE1	5:R:326:LYS:NZ	2.31	0.63
4:N:37:VAL:HG12	4:N:47:TRP:HA	1.81	0.63
4:N:51:ILE:HG22	4:N:58:ILE:HG12	1.81	0.63
5:R:348:LEU:HD12	5:R:390:ILE:HD12	1.81	0.62
5:R:248:ILE:HD11	5:R:319:ILE:HD12	1.82	0.61
1:A:228:ARG:NH2	2:B:162:GLY:O	2.34	0.60
5:R:356:PHE:HZ	5:R:380:ILE:HD13	1.66	0.60
4:N:29:PHE:O	4:N:72:ARG:NH2	2.35	0.60
5:R:178:CYS:H	5:R:181:VAL:HB	1.67	0.60
5:R:409:PHE:O	5:R:413:TRP:HB3	2.02	0.59
4:N:51:ILE:HD12	4:N:72:ARG:HD2	1.84	0.59
5:R:344:ALA:O	5:R:348:LEU:HB2	2.02	0.58
5:R:238:LEU:HD22	5:R:308:ALA:HB1	1.86	0.57
5:R:278:ALA:O	5:R:282:ALA:HB2	2.05	0.57
2:B:250:CYS:HB2	2:B:264:TYR:HB2	1.85	0.56
1:A:283:ARG:O	1:A:357:HIS:ND1	2.38	0.56
4:N:40:ALA:HB3	4:N:43:LYS:HB2	1.87	0.56
2:B:320:VAL:HG22	2:B:327:VAL:HG22	1.88	0.55
1:A:318:TYR:O	1:A:336:ARG:NH2	2.38	0.55
4:N:52:SER:HB3	4:N:57:SER:HB2	1.88	0.55
5:R:409:PHE:O	5:R:413:TRP:CB	2.55	0.55
5:R:178:CYS:SG	5:R:179:GLN:N	2.78	0.55

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:192:LEU:HD23	2:B:199:PHE:HB3	1.89	0.54
2:B:148:CYS:SG	2:B:150:ARG:NH1	2.81	0.54
5:R:339:LEU:HA	5:R:342:VAL:HG12	1.89	0.53
1:A:19:GLN:OE1	2:B:88:ASN:ND2	2.37	0.53
1:A:43:LEU:HD23	1:A:245:ILE:HD11	1.91	0.53
1:A:273:PHE:HE1	1:A:287:VAL:HG11	1.74	0.53
2:B:10:GLU:HA	2:B:13:GLN:HG2	1.91	0.52
2:B:312:ASP:OD1	5:R:404:ARG:NH1	2.41	0.52
1:A:34:LYS:HG3	2:B:55:LEU:HD22	1.90	0.52
1:A:23:ASN:ND2	2:B:88:ASN:OD1	2.43	0.52
4:N:92:ALA:HB3	4:N:94:TYR:HE1	1.75	0.51
2:B:185:GLY:HA3	2:B:204:CYS:HB2	1.92	0.51
2:B:234:PHE:HE2	2:B:238:GLY:HA2	1.74	0.51
4:N:35:ASN:HB3	4:N:50:ASP:HB3	1.93	0.51
5:R:402:VAL:O	5:R:406:TRP:HB2	2.10	0.51
2:B:137:ARG:NE	2:B:171:ILE:O	2.44	0.51
5:R:391:TYR:O	5:R:395:ASN:ND2	2.44	0.50
1:A:42:ARG:HG2	1:A:220:HIS:HB3	1.92	0.50
5:R:228:TYR:HA	5:R:274:THR:HG21	1.93	0.50
2:B:147:SER:OG	2:B:160:SER:OG	2.30	0.50
2:B:58:ILE:HD13	2:B:336:LEU:HD23	1.93	0.50
4:N:68:PHE:HB3	4:N:81:LEU:HD11	1.93	0.50
5:R:342:VAL:O	5:R:346:MET:CB	2.59	0.50
5:R:345:THR:HA	5:R:348:LEU:HB3	1.94	0.50
2:B:314:ARG:HG3	2:B:332:TRP:CD1	2.47	0.50
2:B:71:VAL:HG22	2:B:81:ILE:HG12	1.94	0.49
5:R:349:VAL:HG22	5:R:352:LEU:HD22	1.95	0.49
2:B:269:ILE:HD13	2:B:289:TYR:HE2	1.78	0.48
2:B:95:LEU:HD13	2:B:100:VAL:HG11	1.94	0.48
2:B:198:LEU:HD12	2:B:210:LEU:HD21	1.96	0.48
4:N:73:ASP:O	4:N:77:ASN:N	2.46	0.48
2:B:225:HIS:NE2	2:B:243:THR:OG1	2.40	0.48
2:B:103:CYS:HA	2:B:113:ALA:O	2.14	0.47
2:B:106:ALA:HB3	2:B:110:ASN:H	1.78	0.47
4:N:70:ILE:HA	4:N:80:TYR:O	2.15	0.47
2:B:183:HIS:CE1	2:B:203:ALA:HB2	2.50	0.46
5:R:377:HIS:O	5:R:381:HIS:ND1	2.43	0.46
5:R:278:ALA:O	5:R:282:ALA:CB	2.64	0.46
5:R:366:LYS:HG2	5:R:370:LYS:HE3	1.97	0.46
1:A:10:GLU:HA	1:A:13:ARG:HG2	1.97	0.46
1:A:212:PHE:O	1:A:218:ASN:HA	2.16	0.46

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:372:ILE:HA	1:A:375:VAL:HG12	1.97	0.46
2:B:50:THR:HG23	2:B:337:LYS:HG2	1.98	0.46
3:G:11:GLN:HA	3:G:14:LYS:HE2	1.99	0.45
2:B:228:ASP:N	2:B:228:ASP:OD1	2.47	0.45
5:R:388:ALA:O	5:R:392:CYS:CB	2.57	0.45
4:N:88:PRO:HA	4:N:126:VAL:HG11	1.98	0.45
2:B:283:ARG:NE	2:B:298:ASP:OD1	2.40	0.45
2:B:79:LEU:HD23	2:B:95:LEU:HD21	1.99	0.45
2:B:200:VAL:HG13	2:B:232:ILE:HD13	1.97	0.45
5:R:276:ILE:O	5:R:280:THR:CB	2.62	0.45
2:B:231:ALA:HB3	2:B:275:SER:HA	1.99	0.45
5:R:141:LYS:O	5:R:145:ALA:CB	2.65	0.44
2:B:160:SER:HB3	2:B:190:LEU:HD22	1.99	0.44
4:N:45:LEU:HD13	4:N:112:SER:HA	2.00	0.44
2:B:222:PHE:HE1	2:B:258:ASP:HA	1.83	0.44
5:R:389:THR:O	5:R:393:PHE:HB3	2.17	0.44
5:R:160:ILE:HD13	5:R:160:ILE:HA	1.83	0.43
4:N:104:THR:OG1	4:N:106:ASP:OD1	2.35	0.43
2:B:46:ARG:HB2	2:B:48:ARG:HH12	1.83	0.43
2:B:165:THR:HG22	2:B:181:THR:HG22	2.01	0.43
2:B:249:THR:HG22	2:B:265:SER:HB3	2.00	0.43
5:R:242:ILE:HG22	5:R:315:PHE:HE2	1.83	0.43
2:B:271:CYS:HB2	2:B:290:ASP:HB2	2.00	0.42
2:B:308:LEU:HD12	2:B:308:LEU:HA	1.86	0.42
1:A:228:ARG:NH1	1:A:230:GLU:OE1	2.50	0.42
4:N:111:THR:O	4:N:118:ARG:NH2	2.50	0.42
1:A:231:ARG:HG2	1:A:234:TRP:CZ2	2.54	0.42
4:N:38:ARG:HG2	4:N:94:TYR:CE1	2.54	0.42
1:A:388:LEU:HD22	1:A:394:LEU:HB2	2.00	0.42
5:R:322:VAL:HA	5:R:325:THR:HG22	2.02	0.42
2:B:68:ARG:HG3	2:B:85:TYR:CD2	2.55	0.42
1:A:246:PHE:HZ	1:A:276:ILE:HG12	1.84	0.42
2:B:15:LYS:HB3	3:G:19:LEU:HD11	2.02	0.42
5:R:219:CYS:O	5:R:223:HIS:HB2	2.20	0.42
5:R:414:ASN:HA	5:R:417:TRP:HD1	1.85	0.42
2:B:197:ARG:NH2	2:B:214:ARG:HG2	2.35	0.41
5:R:236:TRP:CE3	5:R:266:GLY:HA3	2.55	0.41
2:B:57:LYS:HD2	2:B:332:TRP:CE3	2.56	0.41
2:B:198:LEU:HD12	2:B:210:LEU:HD11	2.02	0.41
2:B:93:ILE:HG12	2:B:133:VAL:HG21	2.02	0.41
5:R:313:PHE:HA	5:R:354:ILE:HD12	2.03	0.40

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
5:R:349:VAL:O	5:R:351:LEU:N	2.54	0.40
2:B:68:ARG:HG3	2:B:85:TYR:HD2	1.87	0.40
2:B:296:VAL:O	2:B:305:ALA:N	2.55	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	173/380 (46%)	171 (99%)	2 (1%)	0	100	100
2	B	338/351 (96%)	319 (94%)	19 (6%)	0	100	100
3	G	53/68 (78%)	53 (100%)	0	0	100	100
4	N	126/138 (91%)	120 (95%)	6 (5%)	0	100	100
5	R	258/501 (52%)	243 (94%)	15 (6%)	0	100	100
All	All	948/1438 (66%)	906 (96%)	42 (4%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains [i](#)

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

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

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	166/341 (49%)	166 (100%)	0	100	100

*Continued on next page...*

Continued from previous page...

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	B	275/293 (94%)	273 (99%)	2 (1%)	81	86
3	G	44/56 (79%)	44 (100%)	0	100	100
4	N	105/115 (91%)	105 (100%)	0	100	100
5	R	215/445 (48%)	213 (99%)	2 (1%)	75	83
All	All	805/1250 (64%)	801 (100%)	4 (0%)	85	90

All (4) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	B	146	LEU
2	B	340	ASN
5	R	297	LEU
5	R	372	TYR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	377	ASN
4	N	31	ASN
5	R	233	ASN
5	R	302	HIS

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

### 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

## 5.7 Other polymers

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

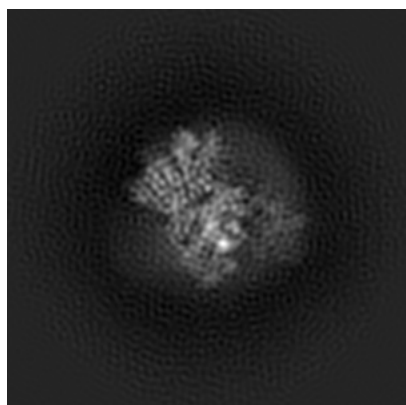
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-8623. These allow visual inspection of the internal detail of the map and identification of artifacts.

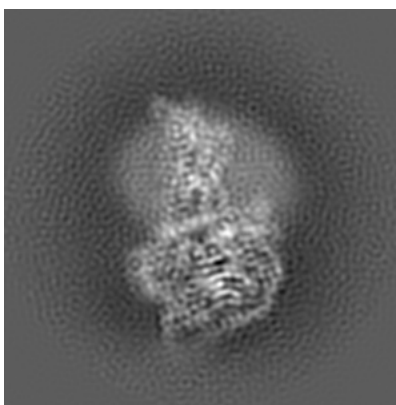
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

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

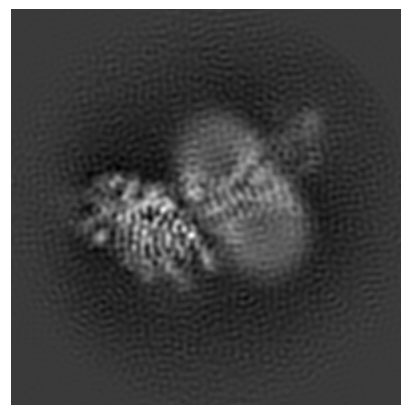
#### 6.1.1 Primary map



X



Y

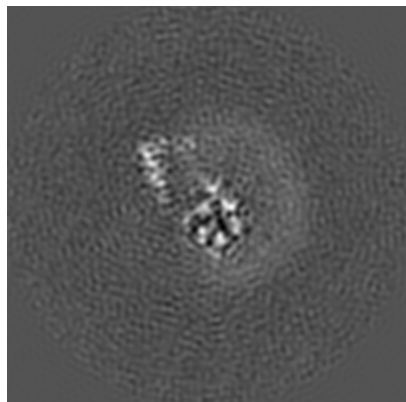


Z

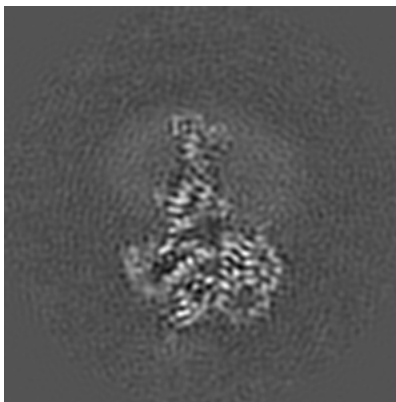
The images above show the map projected in three orthogonal directions.

### 6.2 Central slices [i](#)

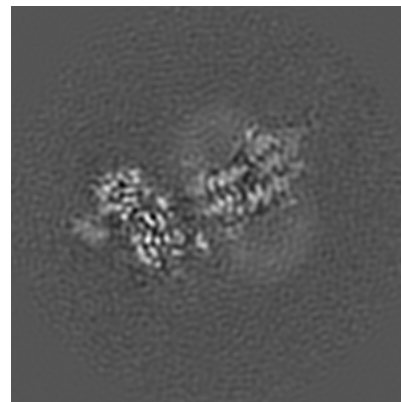
#### 6.2.1 Primary map



X Index: 100



Y Index: 100



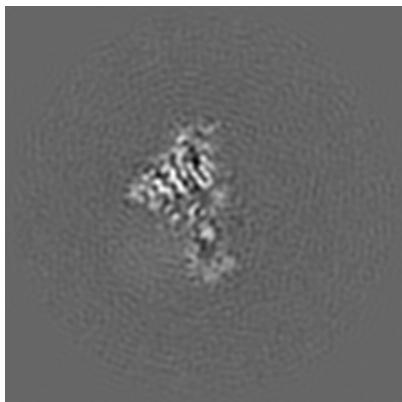
Z Index: 100



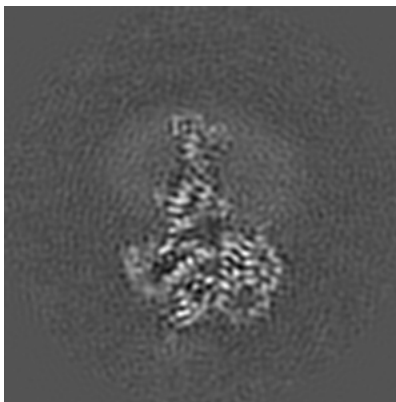
The images above show central slices of the map in three orthogonal directions.

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

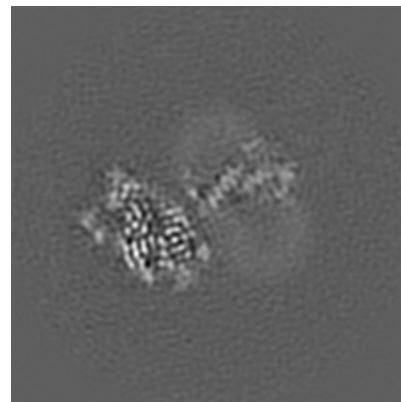
### 6.3.1 Primary map



X Index: 66



Y Index: 100

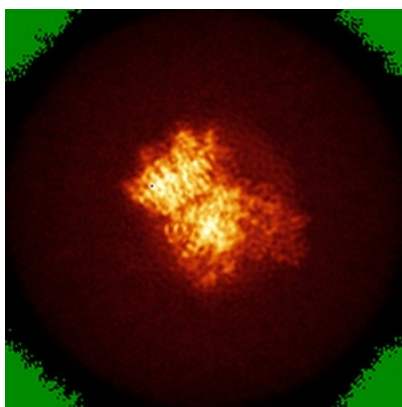


Z Index: 108

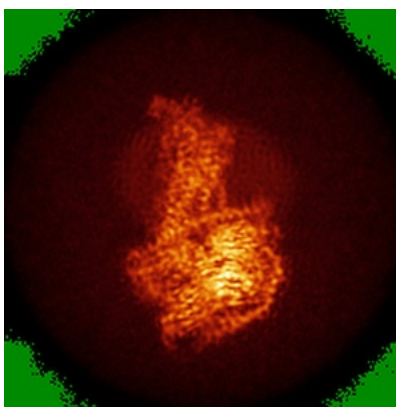
The images above show the largest variance slices of the map in three orthogonal directions.

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

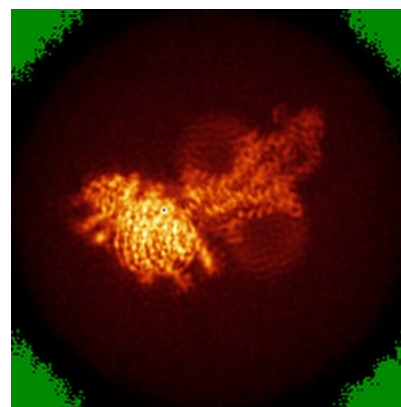
### 6.4.1 Primary map



X



Y



Z

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 0.05. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

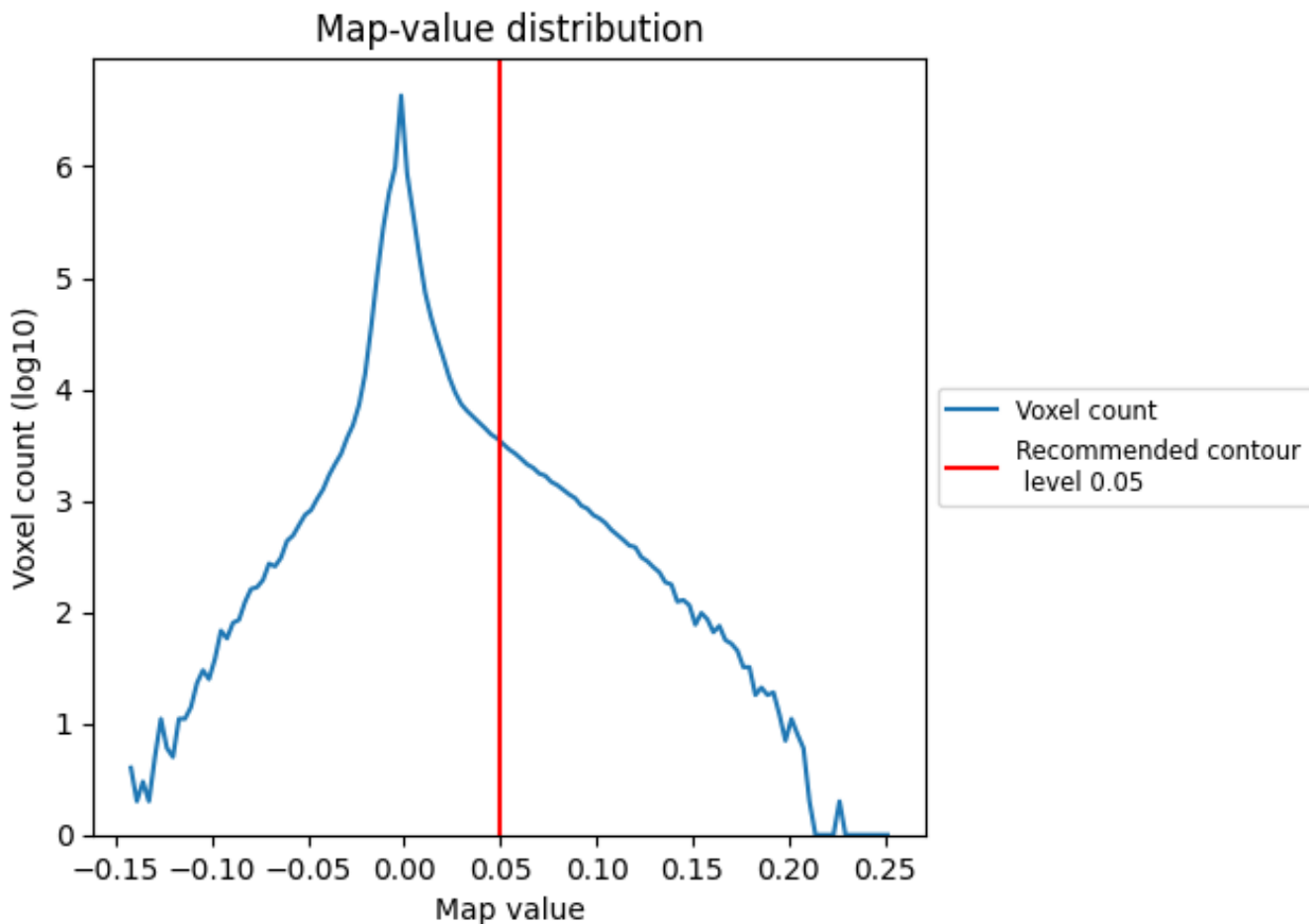
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

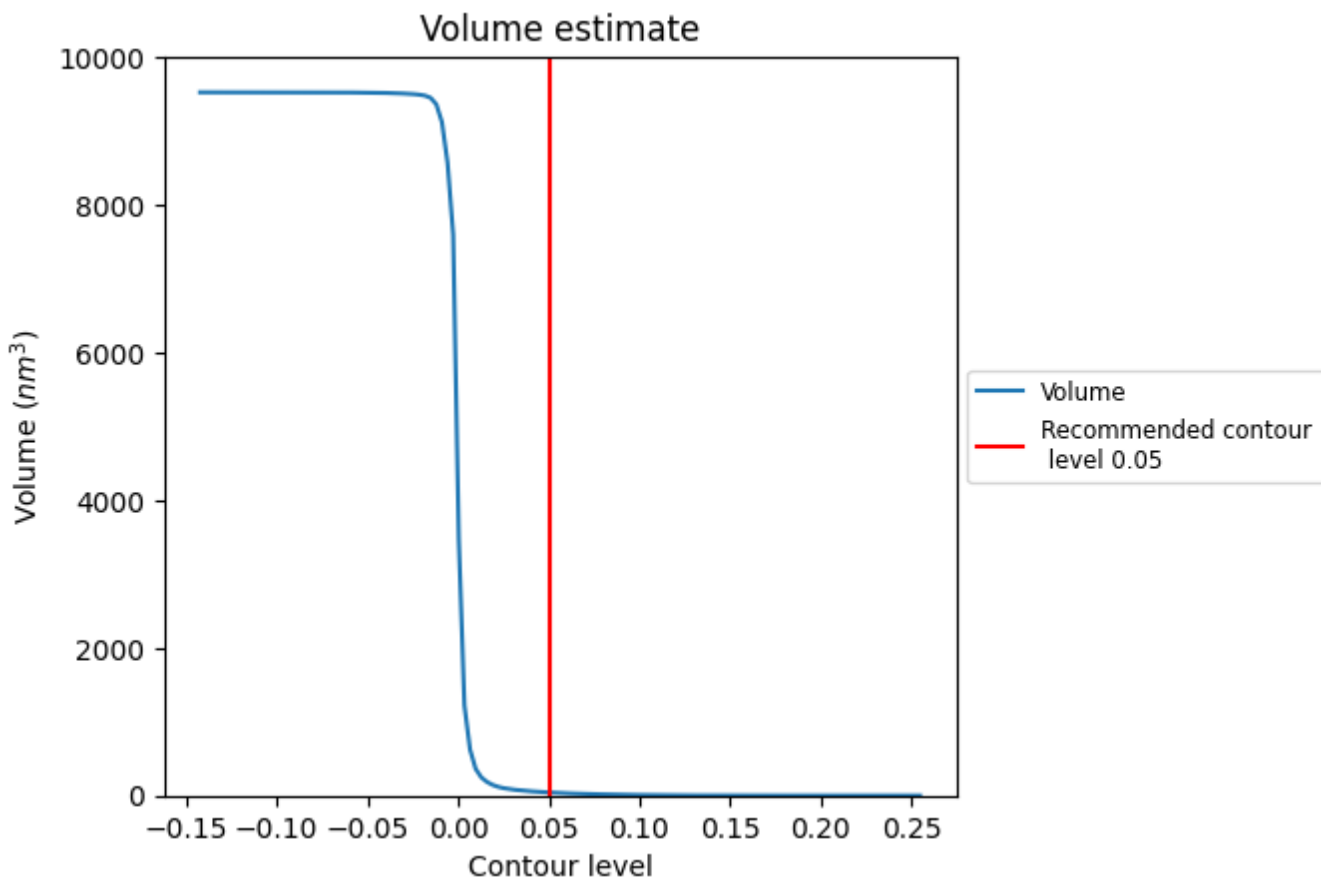
This section contains the results of statistical analysis of the map.

### 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.

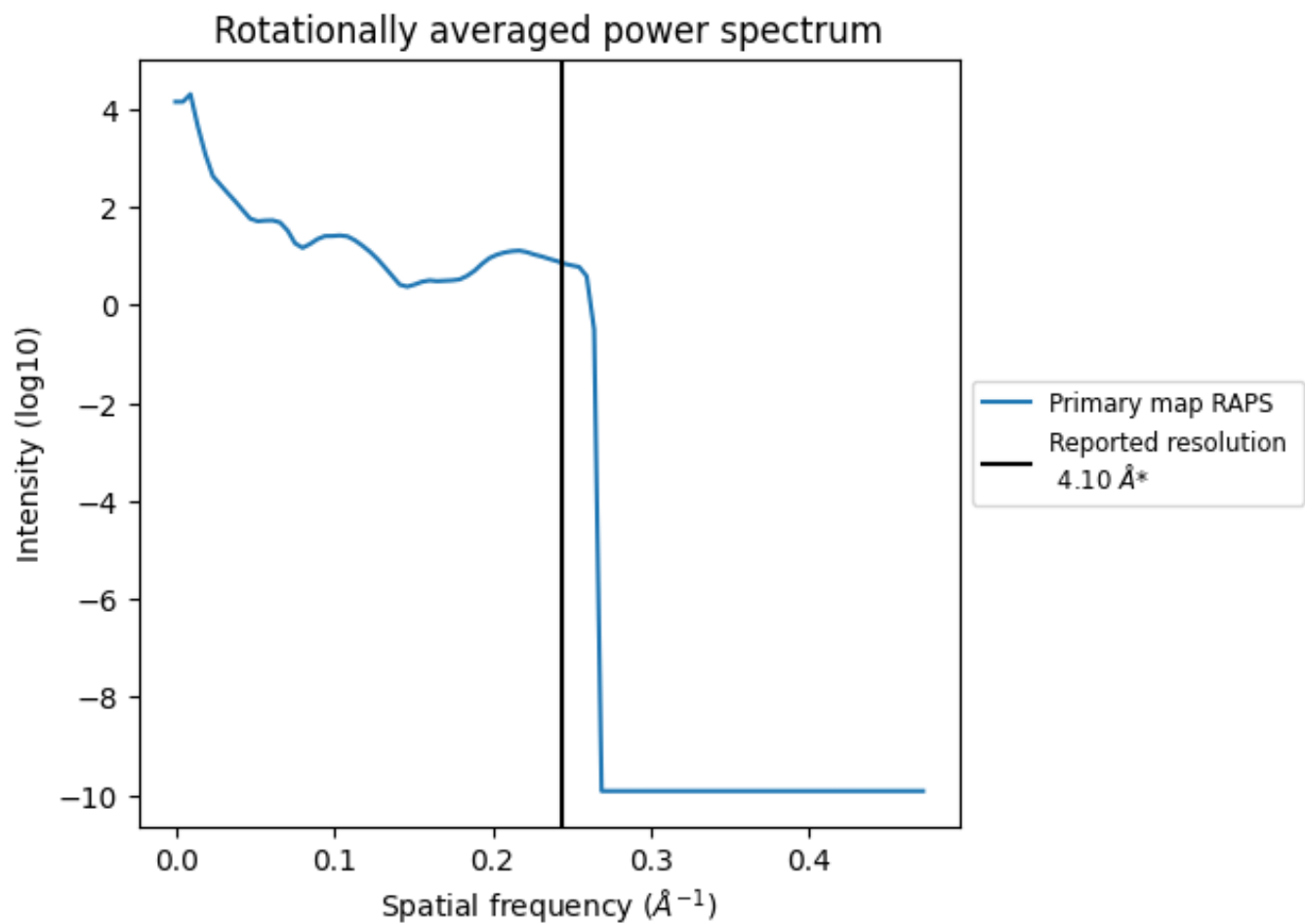
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 42 nm<sup>3</sup>; this corresponds to an approximate mass of 38 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 0.244 Å<sup>-1</sup>

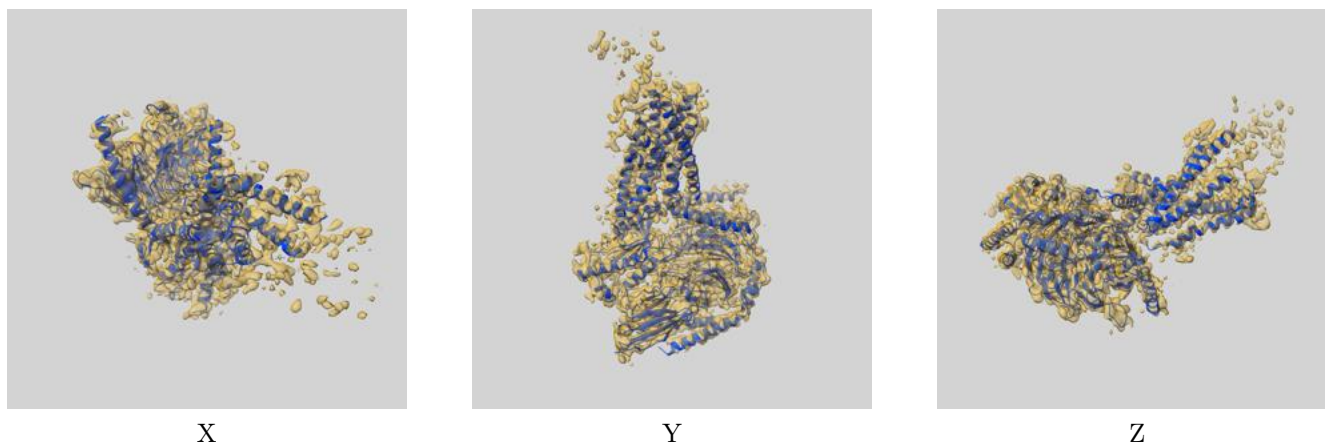
## 8 Fourier-Shell correlation

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

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

This section contains information regarding the fit between EMDB map EMD-8623 and PDB model 5UZ7. Per-residue inclusion information can be found in section 3 on page 6.

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



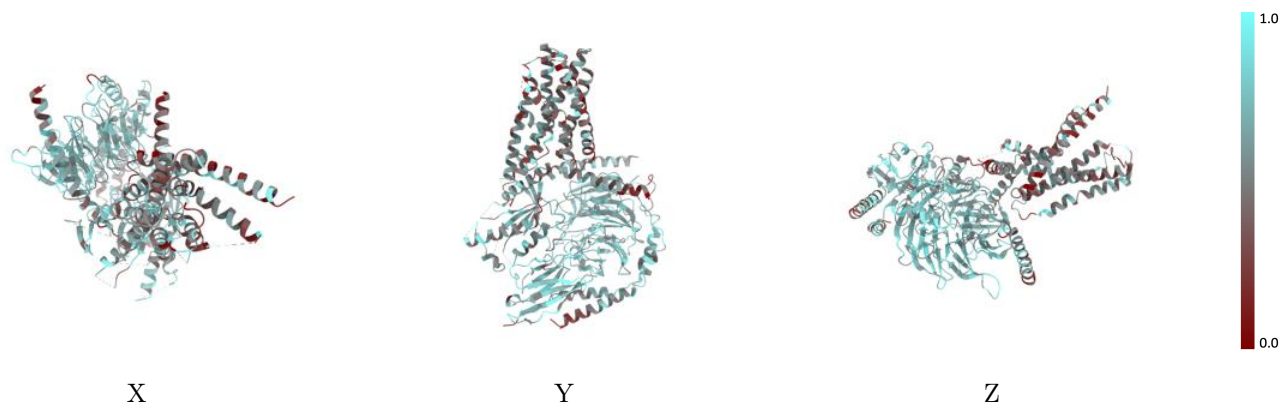
The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



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.

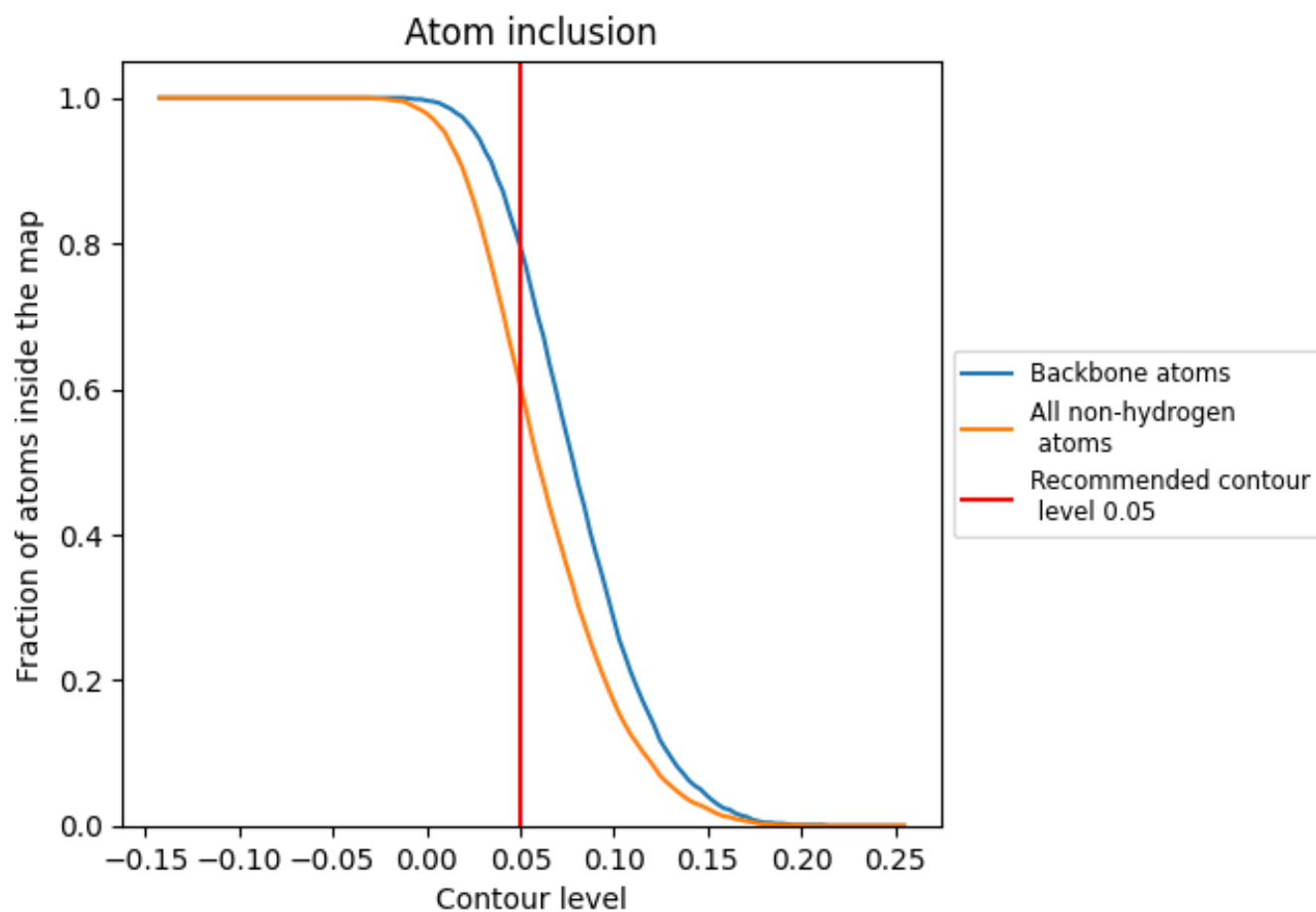
## 9.3 Atom inclusion mapped to coordinate model [\(i\)](#)



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 (0.05).















## 9.4 Atom inclusion [i](#)



At the recommended contour level, 80% of all backbone atoms, 60% 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	 0.6040	 0.4130
A	 0.6090	 0.4100
B	 0.6800	 0.4540
G	 0.6220	 0.3920
N	 0.6880	 0.4550
R	 0.4670	 0.3480

