



## wwPDB EM Validation Summary Report ⓘ

Dec 31, 2024 – 04:44 AM EST

PDB ID : 8H38  
EMDB ID : EMD-34455  
Title : Cryo-EM Structure of the KBTBD2-CRL3 N8-CSN(mutate) complex  
Authors : Hu, Y.; Mao, Q.; Chen, Z.; Sun, L.  
Deposited on : 2022-10-08  
Resolution : 4.25 Å(reported)

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

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev113  
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) : 2.40

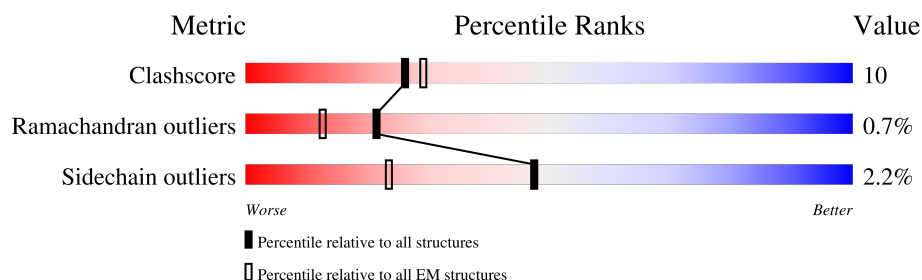
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.25 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



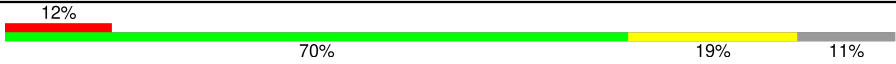

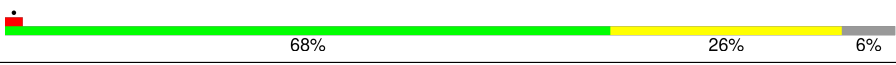
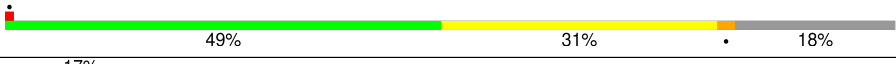

Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	527	
2	B	443	
3	C	423	
4	D	406	
5	E	334	
6	F	327	
7	G	264	
8	H	209	

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Mol	Chain	Length	Quality of chain
9	I	623	
9	M	623	
10	L	768	
11	R	108	
12	N	76	

## 2 Entry composition

There are 13 unique types of molecules in this entry. The entry contains 37306 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 COP9 signalosome complex subunit 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	412	Total	C	N	O	S	0	0
			3296	2088	574	612	22		

There are 55 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	initiating methionine	UNP Q13098
A	2	ARG	-	expression tag	UNP Q13098
A	3	ASP	-	expression tag	UNP Q13098
A	4	SER	-	expression tag	UNP Q13098
A	5	SER	-	expression tag	UNP Q13098
A	6	ALA	-	expression tag	UNP Q13098
A	7	PRO	-	expression tag	UNP Q13098
A	8	SER	-	expression tag	UNP Q13098
A	9	SER	-	expression tag	UNP Q13098
A	10	ALA	-	expression tag	UNP Q13098
A	11	SER	-	expression tag	UNP Q13098
A	12	SER	-	expression tag	UNP Q13098
A	13	SER	-	expression tag	UNP Q13098
A	14	VAL	-	expression tag	UNP Q13098
A	15	THR	-	expression tag	UNP Q13098
A	16	ASP	-	expression tag	UNP Q13098
A	17	LEU	-	expression tag	UNP Q13098
A	18	TYR	-	expression tag	UNP Q13098
A	19	CYS	-	expression tag	UNP Q13098
A	20	THR	-	expression tag	UNP Q13098
A	21	PRO	-	expression tag	UNP Q13098
A	22	HIS	-	expression tag	UNP Q13098
A	23	SER	-	expression tag	UNP Q13098
A	24	SER	-	expression tag	UNP Q13098
A	25	ARG	-	expression tag	UNP Q13098
A	26	SER	-	expression tag	UNP Q13098
A	27	ASP	-	expression tag	UNP Q13098
A	28	LEU	-	expression tag	UNP Q13098

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Chain	Residue	Modelled	Actual	Comment	Reference
A	29	VAL	-	expression tag	UNP Q13098
A	30	LEU	-	expression tag	UNP Q13098
A	31	PRO	-	expression tag	UNP Q13098
A	32	GLY	-	expression tag	UNP Q13098
A	33	THR	-	expression tag	UNP Q13098
A	34	ALA	-	expression tag	UNP Q13098
A	35	GLY	-	expression tag	UNP Q13098
A	36	ASP	-	expression tag	UNP Q13098
A	37	PHE	-	expression tag	UNP Q13098
A	38	SER	-	expression tag	UNP Q13098
A	39	LEU	-	expression tag	UNP Q13098
A	40	SER	-	expression tag	UNP Q13098
A	41	ALA	-	expression tag	UNP Q13098
A	42	SER	-	expression tag	UNP Q13098
A	43	LEU	-	expression tag	UNP Q13098
A	44	SER	-	expression tag	UNP Q13098
A	45	ALA	-	expression tag	UNP Q13098
A	46	CYS	-	expression tag	UNP Q13098
A	47	THR	-	expression tag	UNP Q13098
A	48	LEU	-	expression tag	UNP Q13098
A	49	LEU	-	expression tag	UNP Q13098
A	50	TYR	-	expression tag	UNP Q13098
A	51	GLU	-	expression tag	UNP Q13098
A	?	-	ARG	deletion	UNP Q13098
A	?	-	SER	deletion	UNP Q13098
A	?	-	SER	deletion	UNP Q13098
A	?	-	LEU	deletion	UNP Q13098

- Molecule 2 is a protein called COP9 signalosome complex subunit 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
2	B	420	Total	C	N	O	S	0	0
			3430	2173	587	655	15		

- Molecule 3 is a protein called COP9 signalosome complex subunit 3.

Mol	Chain	Residues	Atoms					AltConf	Trace
3	C	407	Total	C	N	O	S	0	0
			3235	2059	543	606	27		

- Molecule 4 is a protein called COP9 signalosome complex subunit 4.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	D	406	Total	C	N	O	S	0	0
			3251	2047	566	622	16		

- Molecule 5 is a protein called COP9 signalosome complex subunit 5.

Mol	Chain	Residues	Atoms					AltConf	Trace
5	E	309	Total	C	N	O	S	0	0
			2452	1563	408	467	14		

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	138	ALA	HIS	engineered mutation	UNP Q92905

- Molecule 6 is a protein called COP9 signalosome complex subunit 6.

Mol	Chain	Residues	Atoms					AltConf	Trace
6	F	288	Total	C	N	O	S	0	0
			2279	1452	379	433	15		

- Molecule 7 is a protein called COP9 signalosome complex subunit 7b.

Mol	Chain	Residues	Atoms					AltConf	Trace
7	G	214	Total	C	N	O	S	0	0
			1692	1072	287	327	6		

- Molecule 8 is a protein called COP9 signalosome complex subunit 8.

Mol	Chain	Residues	Atoms					AltConf	Trace
8	H	177	Total	C	N	O	S	0	0
			1411	903	245	259	4		

- Molecule 9 is a protein called Kelch repeat and BTB domain-containing protein 2.

Mol	Chain	Residues	Atoms					AltConf	Trace
9	I	557	Total	C	N	O	S	0	0
			4505	2879	746	842	38		
9	M	564	Total	C	N	O	S	0	0
			4557	2911	758	850	38		

- Molecule 10 is a protein called Cullin-3.

Mol	Chain	Residues	Atoms					AltConf	Trace
10	L	720	Total	C	N	O	S	0	0
			5866	3689	1037	1101	39		

- Molecule 11 is a protein called E3 ubiquitin-protein ligase RBX1.

Mol	Chain	Residues	Atoms					AltConf	Trace
11	R	89	Total	C	N	O	S	0	0
			737	466	135	127	9		

- Molecule 12 is a protein called NEDD8.

Mol	Chain	Residues	Atoms					AltConf	Trace
12	N	76	Total	C	N	O	S	0	0
			591	372	102	115	2		

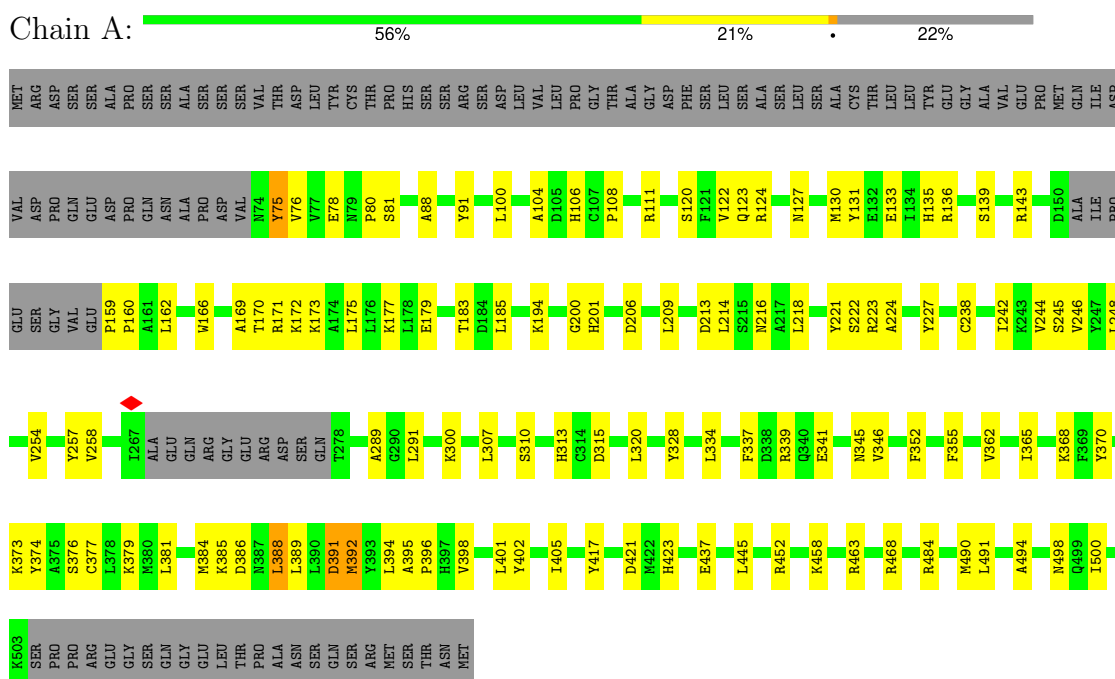
- Molecule 13 is ZINC ION (three-letter code: ZN) (formula: Zn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms		AltConf
13	E	1	Total	Zn	0
			1	1	
13	R	3	Total	Zn	0
			3	3	

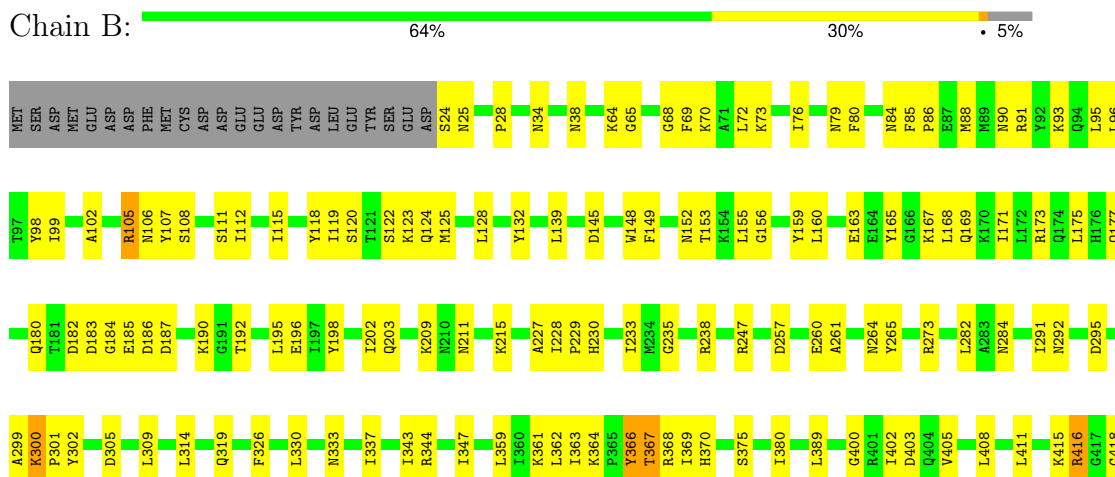
### 3 Residue-property plots

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.

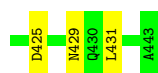
#### • Molecule 1: COP9 signalosome complex subunit 1



#### • Molecule 2: COP9 signalosome complex subunit 2

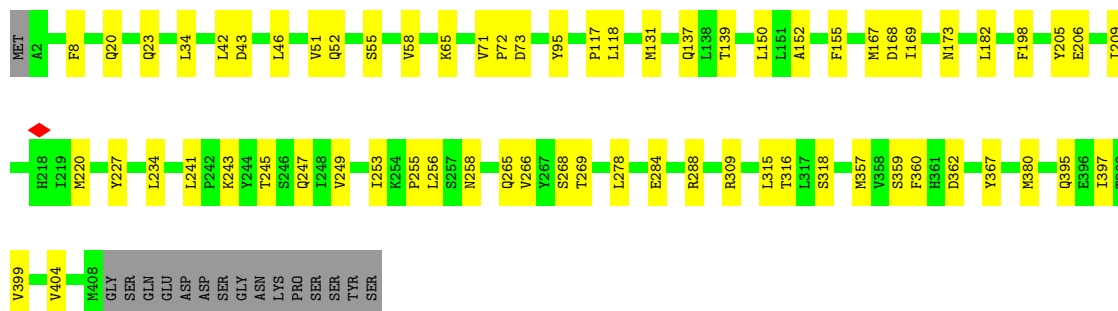






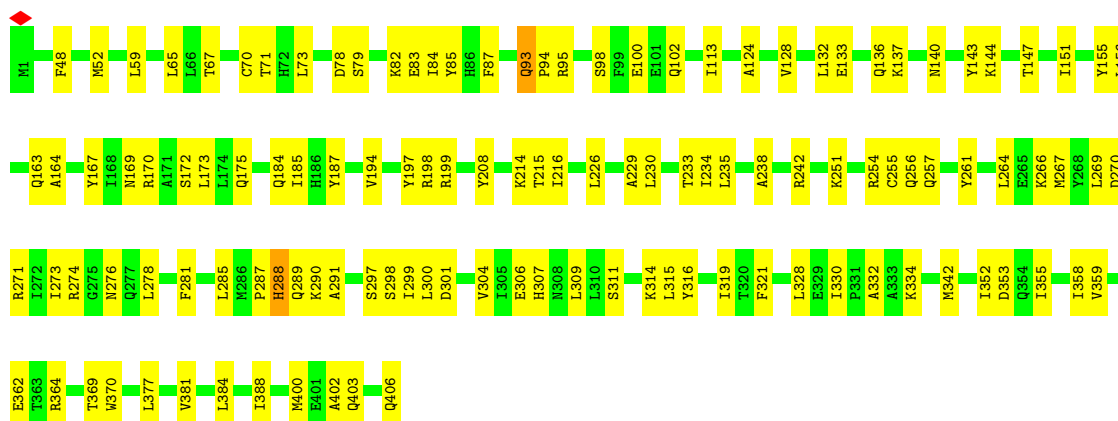
• Molecule 3: COP9 signalosome complex subunit 3

Chain C: 81% 16%



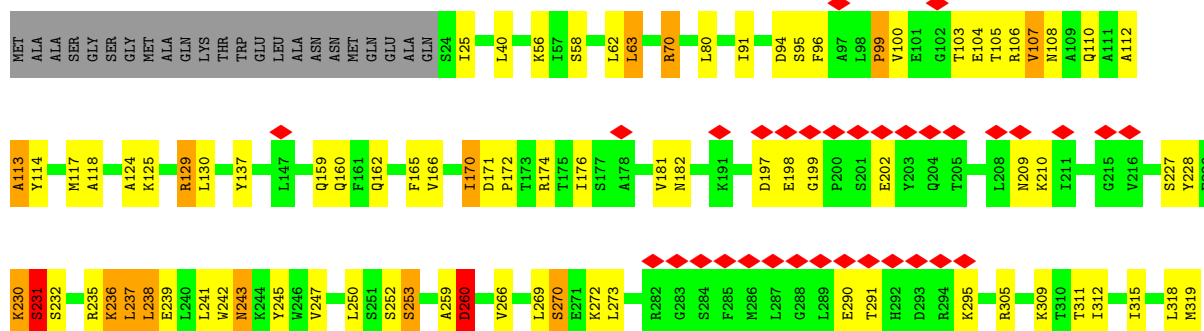
• Molecule 4: COP9 signalosome complex subunit 4

Chain D: 70% 30%

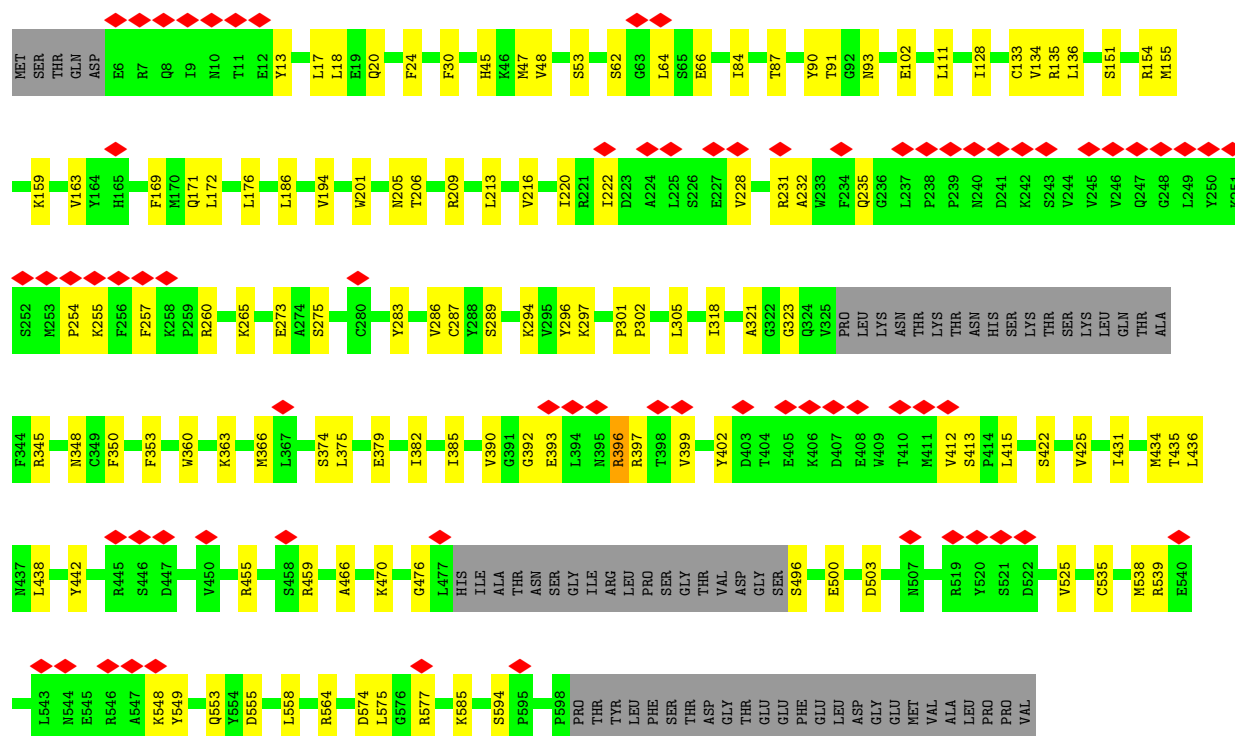


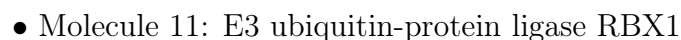
• Molecule 5: COP9 signalosome complex subunit 5

Chain E: 10% 66% 22% 7%









## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of particles used	146505	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 ( $e^-/\text{\AA}^2$ )	53	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2200	Depositor
Magnification	Not provided	
Image detector	GATAN K2 SUMMIT (4k x 4k)	Depositor
Maximum map value	1.577	Depositor
Minimum map value	-0.002	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.020	Depositor
Recommended contour level	0.001	Depositor
Map size (Å)	451.00803, 451.00803, 451.00803	wwPDB
Map dimensions	216, 216, 216	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	2.088, 2.088, 2.088	Depositor

## 5 Model quality [i](#)

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

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

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	0.26	0/3352	0.45	0/4520
2	B	0.26	0/3489	0.44	0/4696
3	C	0.25	0/3294	0.41	0/4448
4	D	0.24	0/3303	0.44	0/4460
5	E	0.50	0/2505	0.60	0/3384
6	F	0.36	0/2326	0.46	0/3153
7	G	0.23	0/1713	0.41	0/2318
8	H	0.24	0/1445	0.44	0/1965
9	I	0.24	0/4611	0.48	0/6253
9	M	0.24	0/4664	0.48	0/6324
10	L	0.26	0/5959	0.49	0/8006
11	R	0.31	0/759	0.52	0/1029
12	N	0.47	0/596	0.55	0/800
All	All	0.29	0/38016	0.47	0/51356

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3296	0	3336	83	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	B	3430	0	3459	85	0
3	C	3235	0	3257	45	0
4	D	3251	0	3253	86	0
5	E	2452	0	2426	61	0
6	F	2279	0	2263	63	0
7	G	1692	0	1730	31	0
8	H	1411	0	1395	16	0
9	I	4505	0	4409	81	0
9	M	4557	0	4473	93	0
10	L	5866	0	5904	142	0
11	R	737	0	686	32	0
12	N	591	0	616	15	0
13	E	1	0	0	0	0
13	R	3	0	0	0	0
All	All	37306	0	37207	737	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 10.

The worst 5 of 737 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:E:114:TYR:HA	5:E:117:MET:HB3	1.49	0.92
10:L:346:LEU:HD11	10:L:414:LYS:HG3	1.54	0.89
5:E:99:PRO:HG3	6:F:114:GLN:HB3	1.57	0.87
12:N:8:LEU:HB2	12:N:71:LEU:HD11	1.57	0.85
4:D:73:LEU:HD13	4:D:85:TYR:HE1	1.48	0.78

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	406/527 (77%)	386 (95%)	20 (5%)	0	100	100
2	B	418/443 (94%)	384 (92%)	30 (7%)	4 (1%)	13	48
3	C	405/423 (96%)	385 (95%)	19 (5%)	1 (0%)	44	78
4	D	404/406 (100%)	373 (92%)	24 (6%)	7 (2%)	7	36
5	E	307/334 (92%)	265 (86%)	35 (11%)	7 (2%)	5	29
6	F	286/327 (88%)	270 (94%)	15 (5%)	1 (0%)	37	72
7	G	212/264 (80%)	209 (99%)	3 (1%)	0	100	100
8	H	173/209 (83%)	172 (99%)	1 (1%)	0	100	100
9	I	551/623 (88%)	514 (93%)	37 (7%)	0	100	100
9	M	558/623 (90%)	531 (95%)	27 (5%)	0	100	100
10	L	716/768 (93%)	649 (91%)	60 (8%)	7 (1%)	13	48
11	R	87/108 (81%)	67 (77%)	19 (22%)	1 (1%)	12	46
12	N	74/76 (97%)	63 (85%)	8 (11%)	3 (4%)	2	19
All	All	4597/5131 (90%)	4268 (93%)	298 (6%)	31 (1%)	21	56

5 of 31 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
4	D	79	SER
4	D	287	PRO
4	D	288	HIS
4	D	291	ALA
5	E	231	SER

### 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	360/458 (79%)	353 (98%)	7 (2%)	52	70
2	B	382/405 (94%)	372 (97%)	10 (3%)	41	61
3	C	363/377 (96%)	361 (99%)	2 (1%)	84	88

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
4	D	347/347 (100%)	347 (100%)	0	100	100
5	E	264/282 (94%)	224 (85%)	40 (15%)	2	12
6	F	255/276 (92%)	249 (98%)	6 (2%)	44	64
7	G	187/229 (82%)	187 (100%)	0	100	100
8	H	147/173 (85%)	147 (100%)	0	100	100
9	I	501/560 (90%)	500 (100%)	1 (0%)	92	93
9	M	507/560 (90%)	507 (100%)	0	100	100
10	L	652/693 (94%)	646 (99%)	6 (1%)	75	83
11	R	78/90 (87%)	74 (95%)	4 (5%)	20	43
12	N	64/66 (97%)	49 (77%)	15 (23%)	0	4
All	All	4107/4516 (91%)	4016 (98%)	91 (2%)	47	66

5 of 91 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
5	E	270	SER
10	L	767	VAL
6	F	90	LEU
9	I	396	ARG
11	R	99	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 50 such sidechains are listed below:

Mol	Chain	Res	Type
9	I	205	ASN
10	L	618	GLN
11	R	98	ASN
9	I	357	GLN
10	L	481	ASN

### 5.3.3 RNA ⓘ

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](#)

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

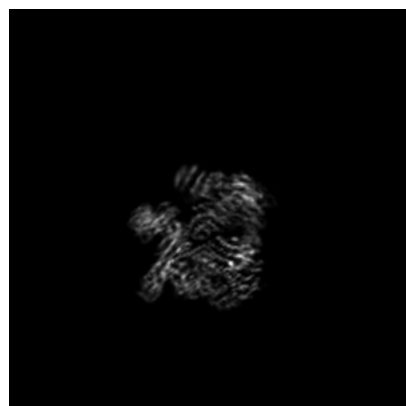
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-34455. These allow visual inspection of the internal detail of the map and identification of artifacts.

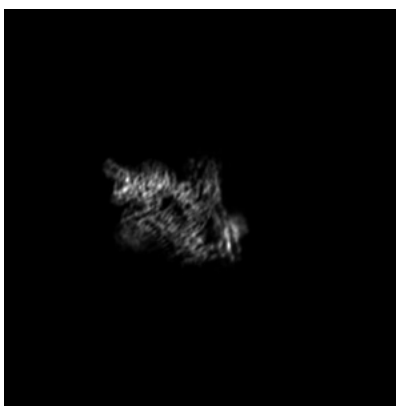
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

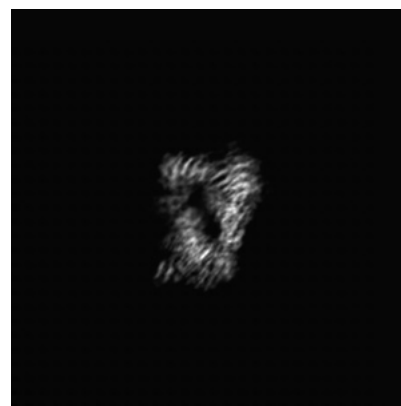
#### 6.1.1 Primary map



X

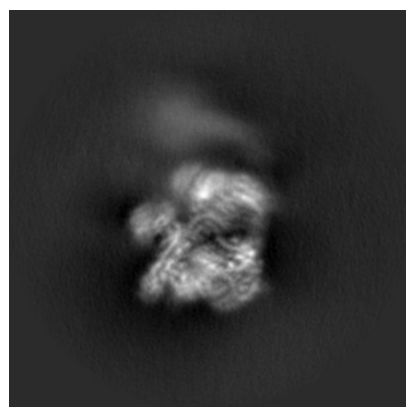


Y

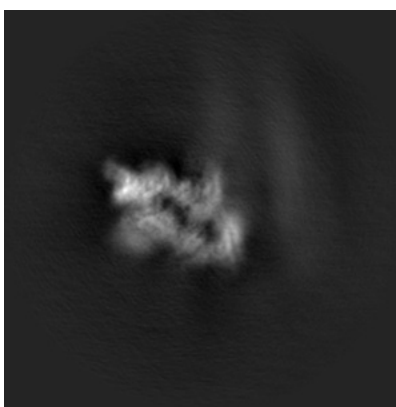


Z

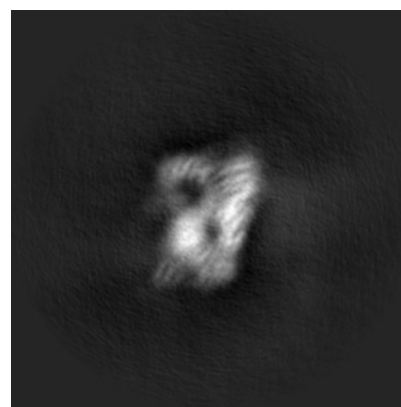
#### 6.1.2 Raw map



X



Y



Z

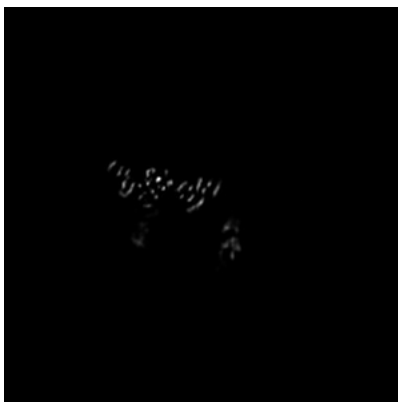
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

### 6.2.1 Primary map



X Index: 108

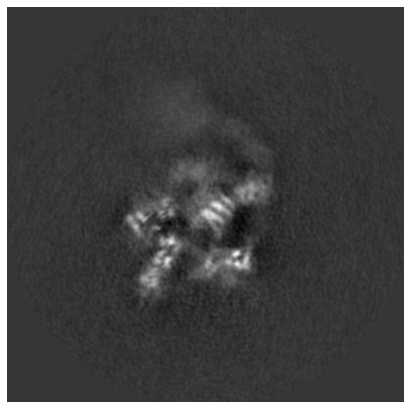


Y Index: 108

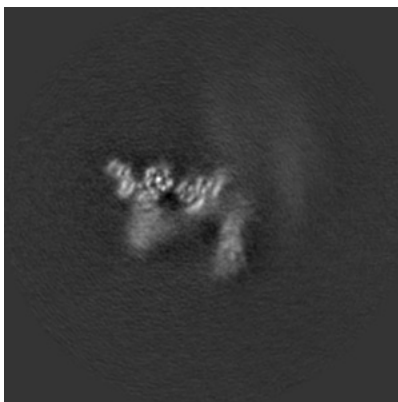


Z Index: 108

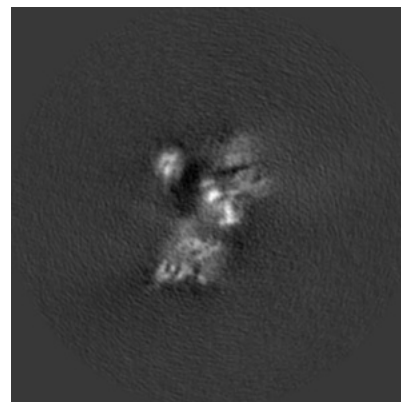
### 6.2.2 Raw map



X Index: 108



Y Index: 108



Z Index: 108

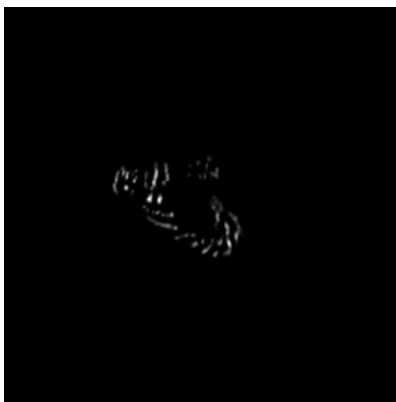
The images above show central slices of the map in three orthogonal directions.

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

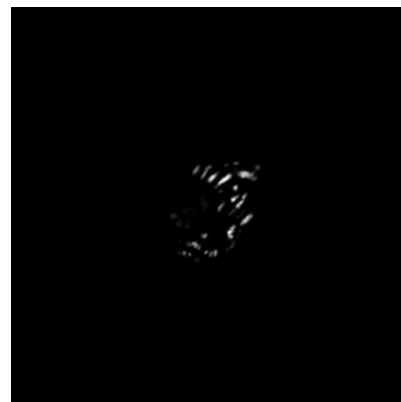
### 6.3.1 Primary map



X Index: 120

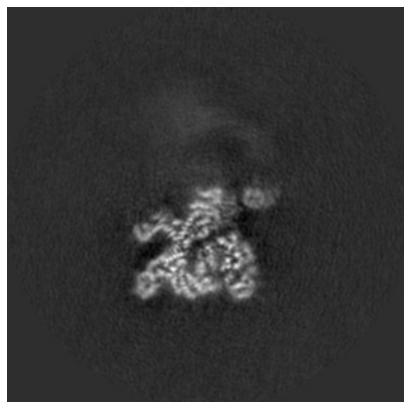


Y Index: 126

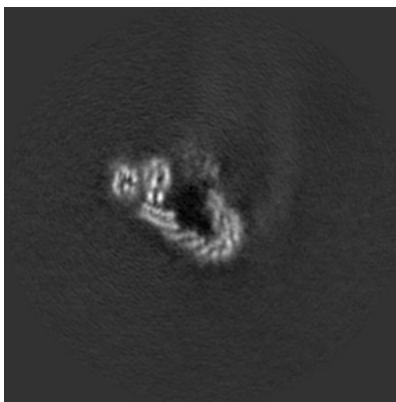


Z Index: 82

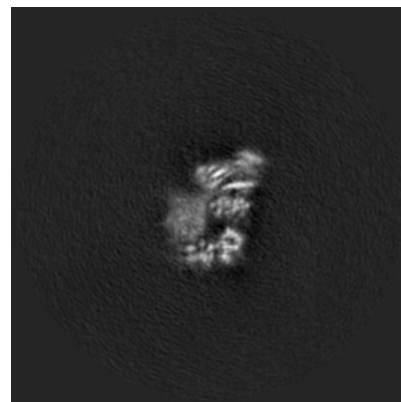
### 6.3.2 Raw map



X Index: 117



Y Index: 127

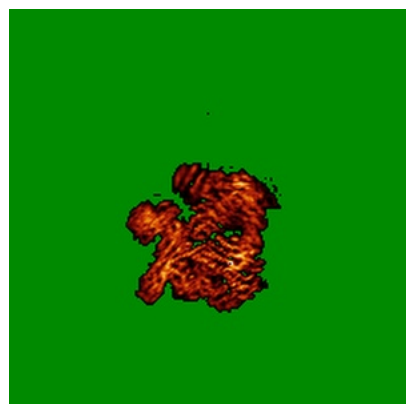


Z Index: 78

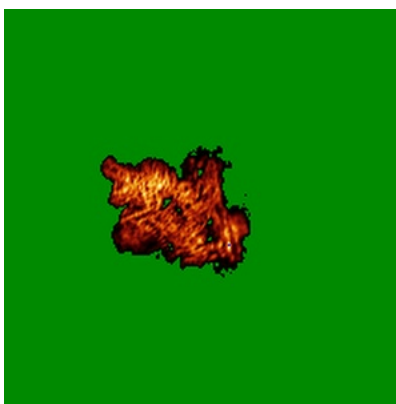
The images above show the largest variance slices of the map in three orthogonal directions.

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

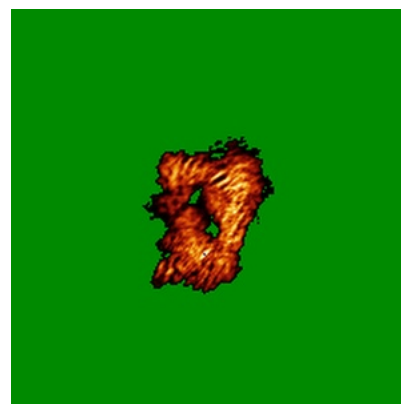
### 6.4.1 Primary map



X

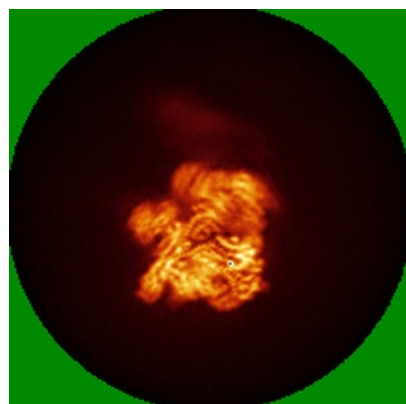


Y

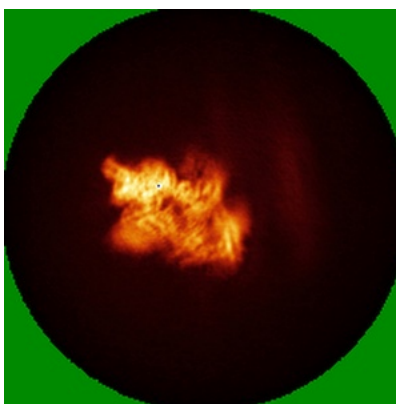


Z

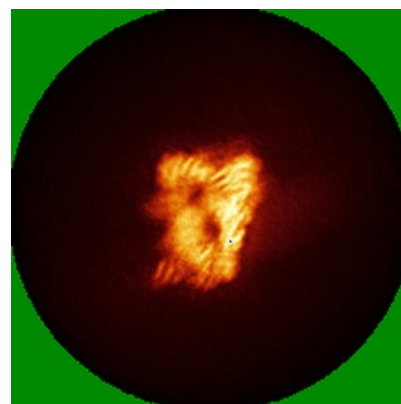
### 6.4.2 Raw map



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



The images above show the 3D surface view of the map at the recommended contour level 0.001. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

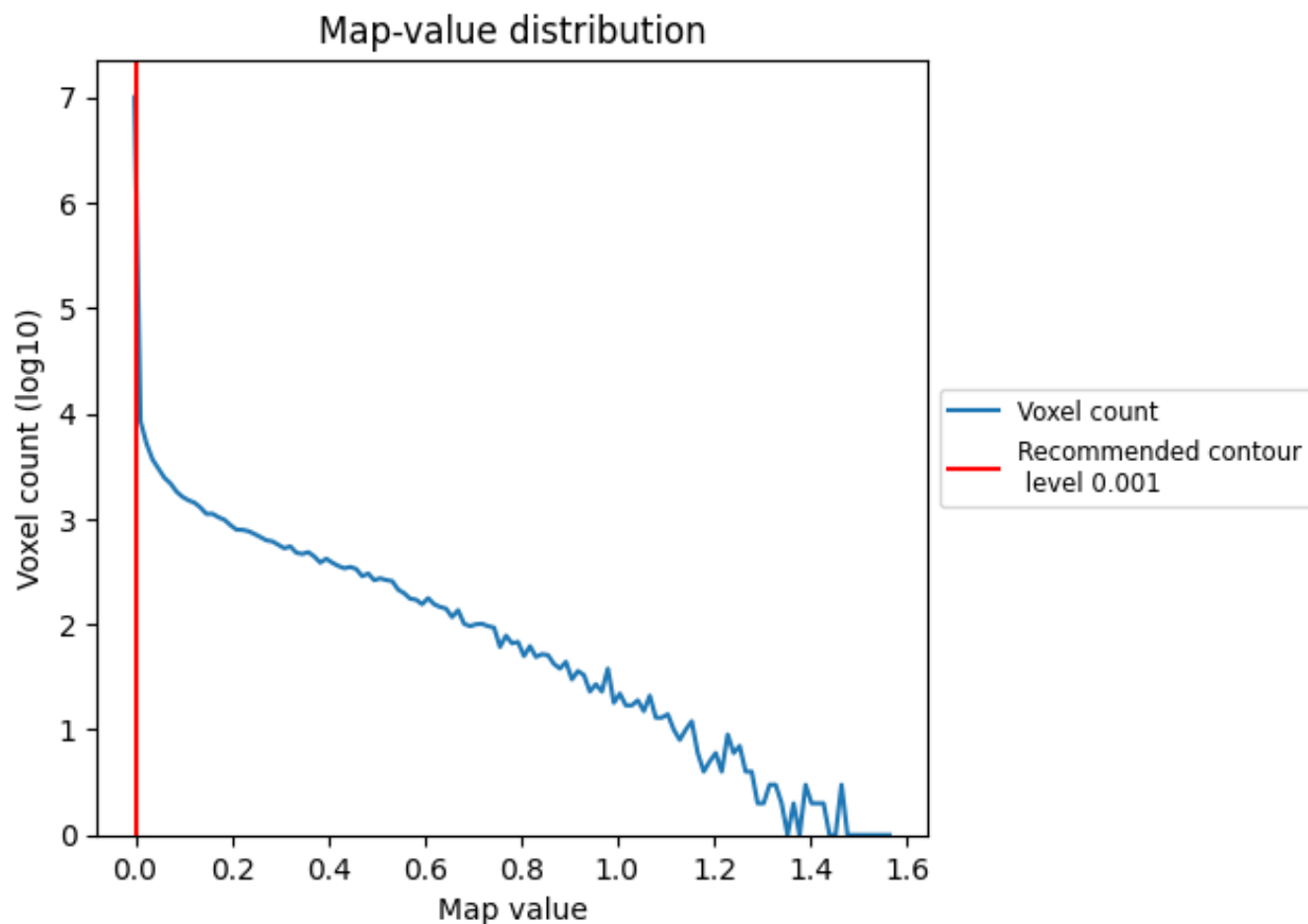
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

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

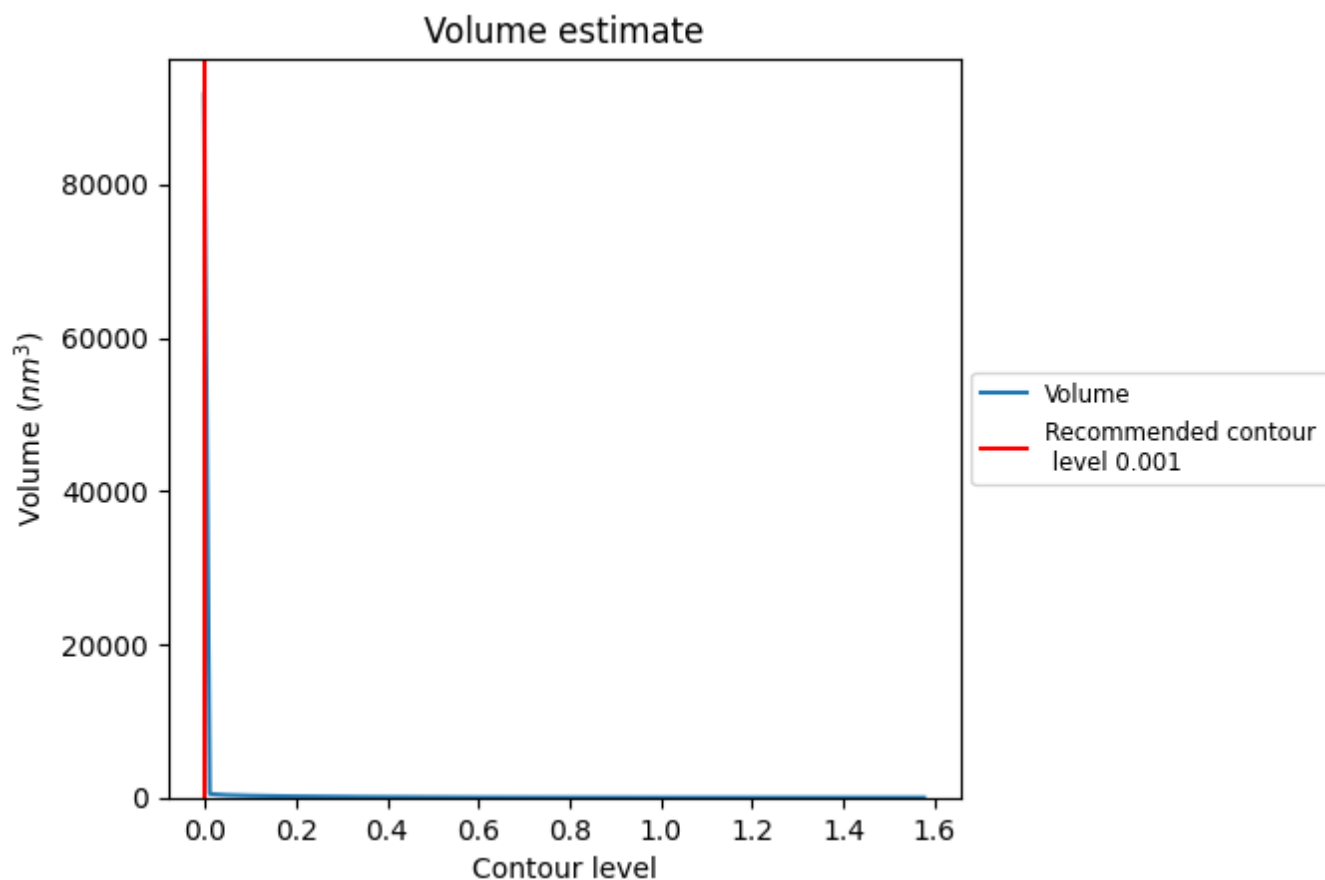
### 7.1 Map-value distribution [i](#)



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



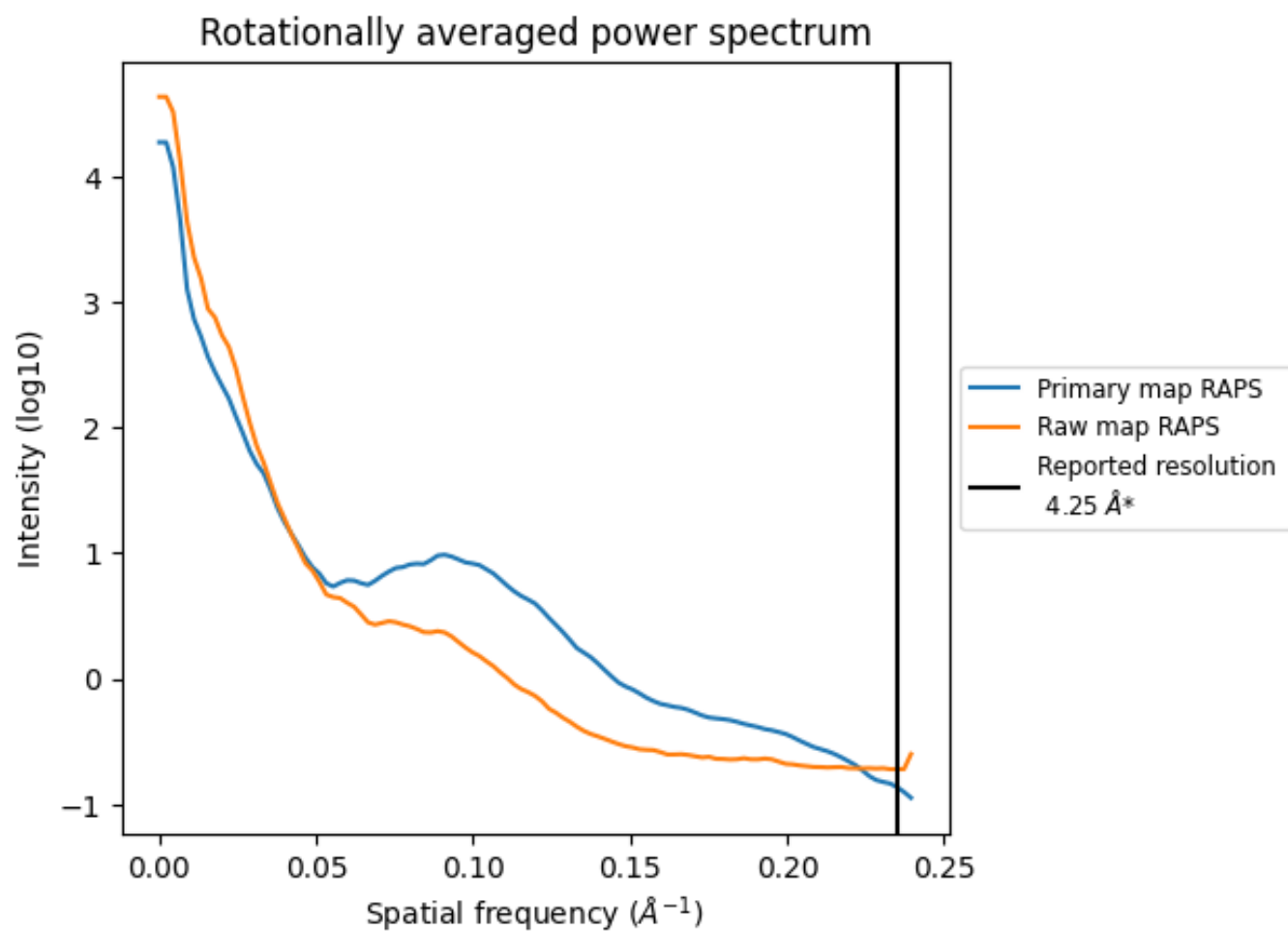
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 72988  $\text{nm}^3$ ; this corresponds to an approximate mass of 65932 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 ⓘ

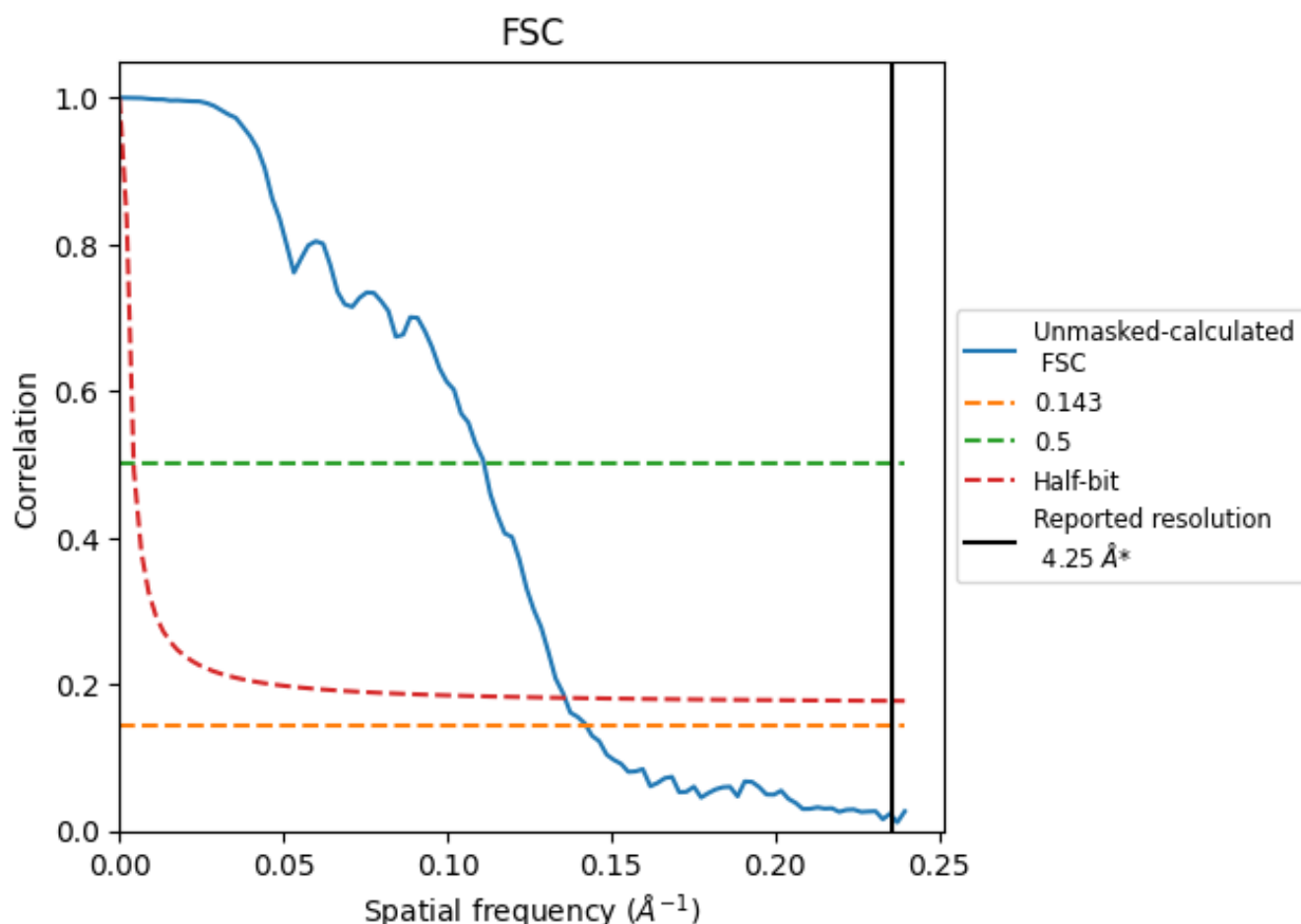


\*Reported resolution corresponds to spatial frequency of 0.235 Å<sup>-1</sup>

## 8 Fourier-Shell correlation [i](#)

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.235 Å<sup>-1</sup>

## 8.2 Resolution estimates [i](#)

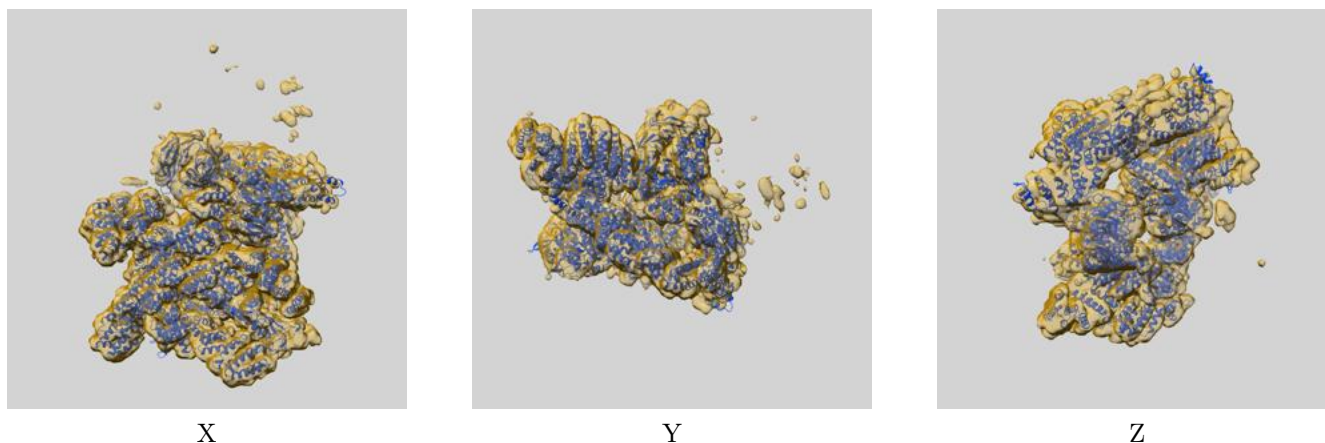
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	4.25	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	7.02	8.99	7.36

\*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 7.02 differs from the reported value 4.25 by more than 10 %

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

This section contains information regarding the fit between EMDB map EMD-34455 and PDB model 8H38. Per-residue inclusion information can be found in section [3](#) on page [8](#).

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



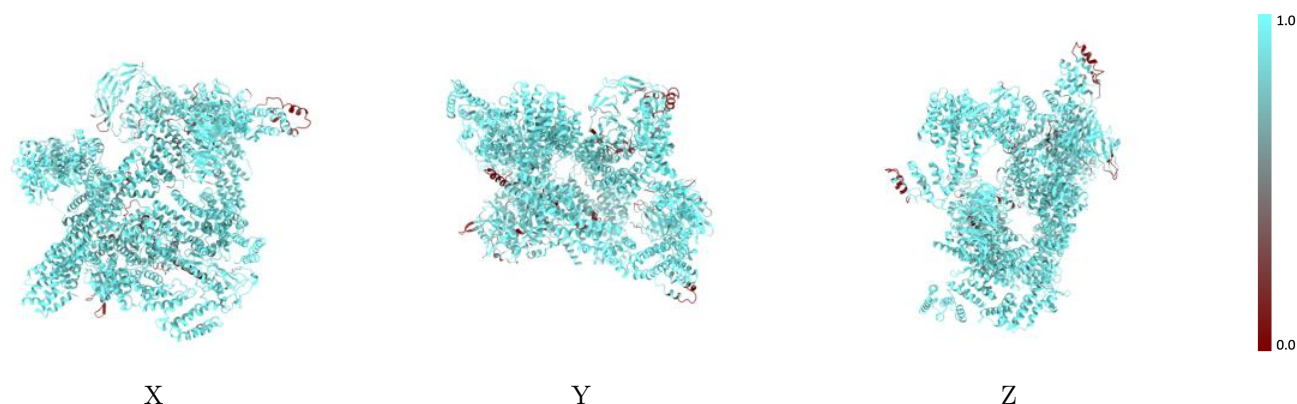
The images above show the 3D surface view of the map at the recommended contour level 0.001 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



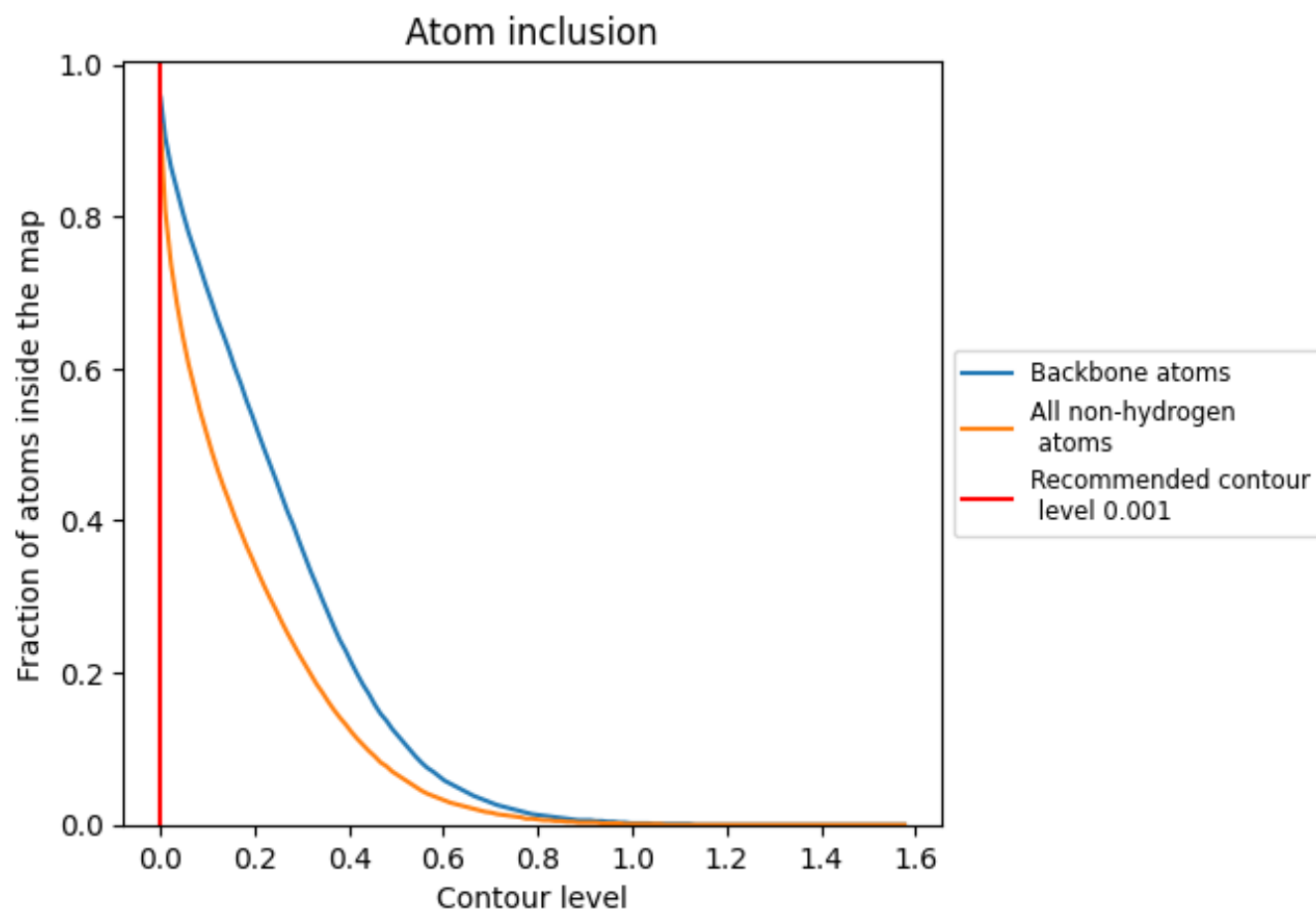
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.001).





























## 9.4 Atom inclusion ⓘ



At the recommended contour level, 96% of all backbone atoms, 92% 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 (0.001) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9200	 0.0780
A	 0.9670	 0.1080
B	 0.9650	 0.1280
C	 0.9640	 0.1260
D	 0.9650	 0.1220
E	 0.8340	 0.0210
F	 0.8830	 0.0690
G	 0.9730	 0.1350
H	 0.9760	 0.1340
I	 0.8320	 0.0110
L	 0.9320	 0.0790
M	 0.9010	 0.0250
N	 0.7900	 -0.0380
R	 0.9460	 0.0970

