



Full wwPDB EM Validation Report ⓘ

Feb 28, 2026 – 08:50 PM UTC

PDB ID : 7SSY / pdb_00007ssy
EMDB ID : EMD-25416
Title : Structure of human Kv1.3 (alternate conformation)
Authors : Meyerson, J.R.; Selvakumar, P.
Deposited on : 2021-11-11
Resolution : 2.89 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

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.dev132
MolProbity : 4-5-2 with Phenix2.0
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) : 2.49

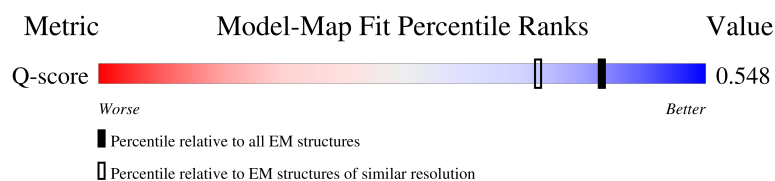
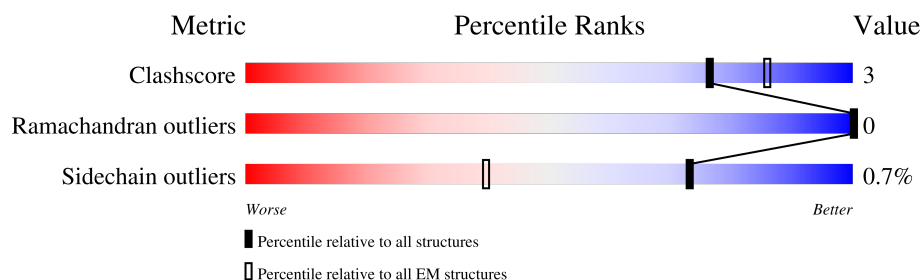
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 2.89 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	12148 (2.39 - 3.39)

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 $\leq 5\%$. 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	856	
1	B	856	
1	C	856	
1	D	856	

2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 11283 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 Potassium voltage-gated channel subfamily A member 3, Green fluorescent protein fusion.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	346	Total	C	N	O	S	0	0
			2820	1857	467	485	11		
1	B	346	Total	C	N	O	S	0	0
			2820	1857	467	485	11		
1	C	346	Total	C	N	O	S	0	0
			2820	1857	467	485	11		
1	D	346	Total	C	N	O	S	0	0
			2820	1857	467	485	11		

There are 220 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	576	SER	-	linker	UNP P22001
A	577	LEU	-	linker	UNP P22001
A	578	GLU	-	linker	UNP P22001
A	579	VAL	-	linker	UNP P22001
A	580	LEU	-	linker	UNP P22001
A	581	PHE	-	linker	UNP P22001
A	582	GLN	-	linker	UNP P22001
A	583	GLY	-	linker	UNP P22001
A	584	PRO	-	linker	UNP P22001
A	585	ALA	-	linker	UNP P22001
A	586	ALA	-	linker	UNP P22001
A	587	ALA	-	linker	UNP P22001
A	588	MET	-	linker	UNP P22001
A	589	VAL	-	linker	UNP P22001
A	634	LEU	PHE	conflict	UNP P42212
A	652	LEU	PHE	conflict	UNP P42212
A	653	GLY	SER	conflict	UNP P42212
A	656	LEU	VAL	conflict	UNP P42212
A	660	ALA	SER	conflict	UNP P42212
A	741	THR	MET	conflict	UNP P42212
A	751	ALA	VAL	conflict	UNP P42212

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Chain	Residue	Modelled	Actual	Comment	Reference
A	763	GLY	SER	conflict	UNP P42212
A	791	TYR	THR	conflict	UNP P42212
A	794	LYS	ALA	conflict	UNP P42212
A	819	LEU	HIS	conflict	UNP P42212
A	827	SER	-	expression tag	UNP P42212
A	828	ALA	-	expression tag	UNP P42212
A	829	TRP	-	expression tag	UNP P42212
A	830	SER	-	expression tag	UNP P42212
A	831	HIS	-	expression tag	UNP P42212
A	832	PRO	-	expression tag	UNP P42212
A	833	GLN	-	expression tag	UNP P42212
A	834	PHE	-	expression tag	UNP P42212
A	835	GLU	-	expression tag	UNP P42212
A	836	LYS	-	expression tag	UNP P42212
A	837	GLY	-	expression tag	UNP P42212
A	838	GLY	-	expression tag	UNP P42212
A	839	GLY	-	expression tag	UNP P42212
A	840	SER	-	expression tag	UNP P42212
A	841	GLY	-	expression tag	UNP P42212
A	842	GLY	-	expression tag	UNP P42212
A	843	GLY	-	expression tag	UNP P42212
A	844	SER	-	expression tag	UNP P42212
A	845	GLY	-	expression tag	UNP P42212
A	846	GLY	-	expression tag	UNP P42212
A	847	GLY	-	expression tag	UNP P42212
A	848	SER	-	expression tag	UNP P42212
A	849	TRP	-	expression tag	UNP P42212
A	850	SER	-	expression tag	UNP P42212
A	851	HIS	-	expression tag	UNP P42212
A	852	PRO	-	expression tag	UNP P42212
A	853	GLN	-	expression tag	UNP P42212
A	854	PHE	-	expression tag	UNP P42212
A	855	GLU	-	expression tag	UNP P42212
A	856	LYS	-	expression tag	UNP P42212
B	576	SER	-	linker	UNP P22001
B	577	LEU	-	linker	UNP P22001
B	578	GLU	-	linker	UNP P22001
B	579	VAL	-	linker	UNP P22001
B	580	LEU	-	linker	UNP P22001
B	581	PHE	-	linker	UNP P22001
B	582	GLN	-	linker	UNP P22001
B	583	GLY	-	linker	UNP P22001

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Chain	Residue	Modelled	Actual	Comment	Reference
B	584	PRO	-	linker	UNP P22001
B	585	ALA	-	linker	UNP P22001
B	586	ALA	-	linker	UNP P22001
B	587	ALA	-	linker	UNP P22001
B	588	MET	-	linker	UNP P22001
B	589	VAL	-	linker	UNP P22001
B	634	LEU	PHE	conflict	UNP P42212
B	652	LEU	PHE	conflict	UNP P42212
B	653	GLY	SER	conflict	UNP P42212
B	656	LEU	VAL	conflict	UNP P42212
B	660	ALA	SER	conflict	UNP P42212
B	741	THR	MET	conflict	UNP P42212
B	751	ALA	VAL	conflict	UNP P42212
B	763	GLY	SER	conflict	UNP P42212
B	791	TYR	THR	conflict	UNP P42212
B	794	LYS	ALA	conflict	UNP P42212
B	819	LEU	HIS	conflict	UNP P42212
B	827	SER	-	expression tag	UNP P42212
B	828	ALA	-	expression tag	UNP P42212
B	829	TRP	-	expression tag	UNP P42212
B	830	SER	-	expression tag	UNP P42212
B	831	HIS	-	expression tag	UNP P42212
B	832	PRO	-	expression tag	UNP P42212
B	833	GLN	-	expression tag	UNP P42212
B	834	PHE	-	expression tag	UNP P42212
B	835	GLU	-	expression tag	UNP P42212
B	836	LYS	-	expression tag	UNP P42212
B	837	GLY	-	expression tag	UNP P42212
B	838	GLY	-	expression tag	UNP P42212
B	839	GLY	-	expression tag	UNP P42212
B	840	SER	-	expression tag	UNP P42212
B	841	GLY	-	expression tag	UNP P42212
B	842	GLY	-	expression tag	UNP P42212
B	843	GLY	-	expression tag	UNP P42212
B	844	SER	-	expression tag	UNP P42212
B	845	GLY	-	expression tag	UNP P42212
B	846	GLY	-	expression tag	UNP P42212
B	847	GLY	-	expression tag	UNP P42212
B	848	SER	-	expression tag	UNP P42212
B	849	TRP	-	expression tag	UNP P42212
B	850	SER	-	expression tag	UNP P42212
B	851	HIS	-	expression tag	UNP P42212

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Chain	Residue	Modelled	Actual	Comment	Reference
B	852	PRO	-	expression tag	UNP P42212
B	853	GLN	-	expression tag	UNP P42212
B	854	PHE	-	expression tag	UNP P42212
B	855	GLU	-	expression tag	UNP P42212
B	856	LYS	-	expression tag	UNP P42212
C	576	SER	-	linker	UNP P22001
C	577	LEU	-	linker	UNP P22001
C	578	GLU	-	linker	UNP P22001
C	579	VAL	-	linker	UNP P22001
C	580	LEU	-	linker	UNP P22001
C	581	PHE	-	linker	UNP P22001
C	582	GLN	-	linker	UNP P22001
C	583	GLY	-	linker	UNP P22001
C	584	PRO	-	linker	UNP P22001
C	585	ALA	-	linker	UNP P22001
C	586	ALA	-	linker	UNP P22001
C	587	ALA	-	linker	UNP P22001
C	588	MET	-	linker	UNP P22001
C	589	VAL	-	linker	UNP P22001
C	634	LEU	PHE	conflict	UNP P42212
C	652	LEU	PHE	conflict	UNP P42212
C	653	GLY	SER	conflict	UNP P42212
C	656	LEU	VAL	conflict	UNP P42212
C	660	ALA	SER	conflict	UNP P42212
C	741	THR	MET	conflict	UNP P42212
C	751	ALA	VAL	conflict	UNP P42212
C	763	GLY	SER	conflict	UNP P42212
C	791	TYR	THR	conflict	UNP P42212
C	794	LYS	ALA	conflict	UNP P42212
C	819	LEU	HIS	conflict	UNP P42212
C	827	SER	-	expression tag	UNP P42212
C	828	ALA	-	expression tag	UNP P42212
C	829	TRP	-	expression tag	UNP P42212
C	830	SER	-	expression tag	UNP P42212
C	831	HIS	-	expression tag	UNP P42212
C	832	PRO	-	expression tag	UNP P42212
C	833	GLN	-	expression tag	UNP P42212
C	834	PHE	-	expression tag	UNP P42212
C	835	GLU	-	expression tag	UNP P42212
C	836	LYS	-	expression tag	UNP P42212
C	837	GLY	-	expression tag	UNP P42212
C	838	GLY	-	expression tag	UNP P42212

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Chain	Residue	Modelled	Actual	Comment	Reference
C	839	GLY	-	expression tag	UNP P42212
C	840	SER	-	expression tag	UNP P42212
C	841	GLY	-	expression tag	UNP P42212
C	842	GLY	-	expression tag	UNP P42212
C	843	GLY	-	expression tag	UNP P42212
C	844	SER	-	expression tag	UNP P42212
C	845	GLY	-	expression tag	UNP P42212
C	846	GLY	-	expression tag	UNP P42212
C	847	GLY	-	expression tag	UNP P42212
C	848	SER	-	expression tag	UNP P42212
C	849	TRP	-	expression tag	UNP P42212
C	850	SER	-	expression tag	UNP P42212
C	851	HIS	-	expression tag	UNP P42212
C	852	PRO	-	expression tag	UNP P42212
C	853	GLN	-	expression tag	UNP P42212
C	854	PHE	-	expression tag	UNP P42212
C	855	GLU	-	expression tag	UNP P42212
C	856	LYS	-	expression tag	UNP P42212
D	576	SER	-	linker	UNP P22001
D	577	LEU	-	linker	UNP P22001
D	578	GLU	-	linker	UNP P22001
D	579	VAL	-	linker	UNP P22001
D	580	LEU	-	linker	UNP P22001
D	581	PHE	-	linker	UNP P22001
D	582	GLN	-	linker	UNP P22001
D	583	GLY	-	linker	UNP P22001
D	584	PRO	-	linker	UNP P22001
D	585	ALA	-	linker	UNP P22001
D	586	ALA	-	linker	UNP P22001
D	587	ALA	-	linker	UNP P22001
D	588	MET	-	linker	UNP P22001
D	589	VAL	-	linker	UNP P22001
D	634	LEU	PHE	conflict	UNP P42212
D	652	LEU	PHE	conflict	UNP P42212
D	653	GLY	SER	conflict	UNP P42212
D	656	LEU	VAL	conflict	UNP P42212
D	660	ALA	SER	conflict	UNP P42212
D	741	THR	MET	conflict	UNP P42212
D	751	ALA	VAL	conflict	UNP P42212
D	763	GLY	SER	conflict	UNP P42212
D	791	TYR	THR	conflict	UNP P42212
D	794	LYS	ALA	conflict	UNP P42212

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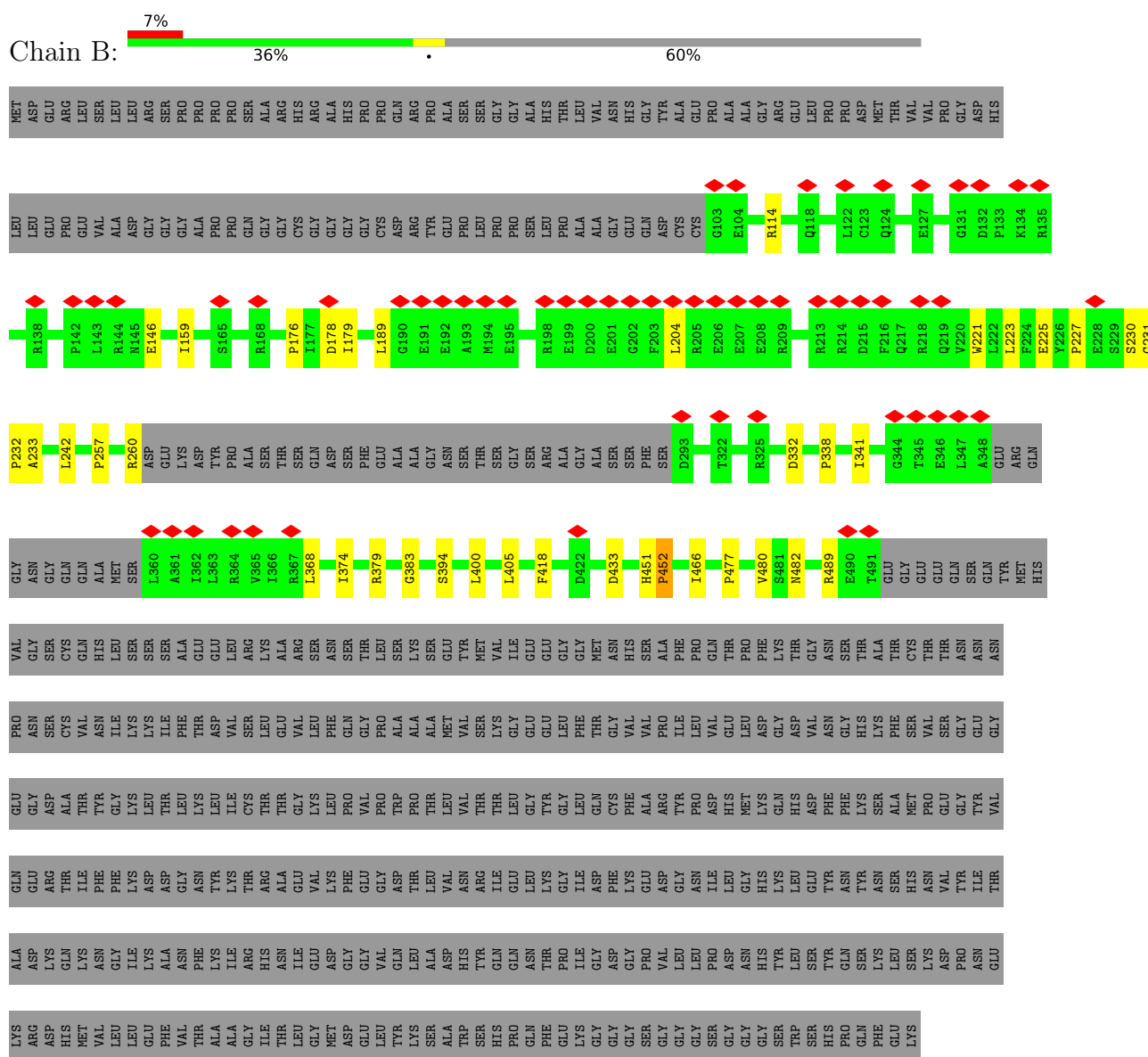
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Chain	Residue	Modelled	Actual	Comment	Reference
D	819	LEU	HIS	conflict	UNP P42212
D	827	SER	-	expression tag	UNP P42212
D	828	ALA	-	expression tag	UNP P42212
D	829	TRP	-	expression tag	UNP P42212
D	830	SER	-	expression tag	UNP P42212
D	831	HIS	-	expression tag	UNP P42212
D	832	PRO	-	expression tag	UNP P42212
D	833	GLN	-	expression tag	UNP P42212
D	834	PHE	-	expression tag	UNP P42212
D	835	GLU	-	expression tag	UNP P42212
D	836	LYS	-	expression tag	UNP P42212
D	837	GLY	-	expression tag	UNP P42212
D	838	GLY	-	expression tag	UNP P42212
D	839	GLY	-	expression tag	UNP P42212
D	840	SER	-	expression tag	UNP P42212
D	841	GLY	-	expression tag	UNP P42212
D	842	GLY	-	expression tag	UNP P42212
D	843	GLY	-	expression tag	UNP P42212
D	844	SER	-	expression tag	UNP P42212
D	845	GLY	-	expression tag	UNP P42212
D	846	GLY	-	expression tag	UNP P42212
D	847	GLY	-	expression tag	UNP P42212
D	848	SER	-	expression tag	UNP P42212
D	849	TRP	-	expression tag	UNP P42212
D	850	SER	-	expression tag	UNP P42212
D	851	HIS	-	expression tag	UNP P42212
D	852	PRO	-	expression tag	UNP P42212
D	853	GLN	-	expression tag	UNP P42212
D	854	PHE	-	expression tag	UNP P42212
D	855	GLU	-	expression tag	UNP P42212
D	856	LYS	-	expression tag	UNP P42212

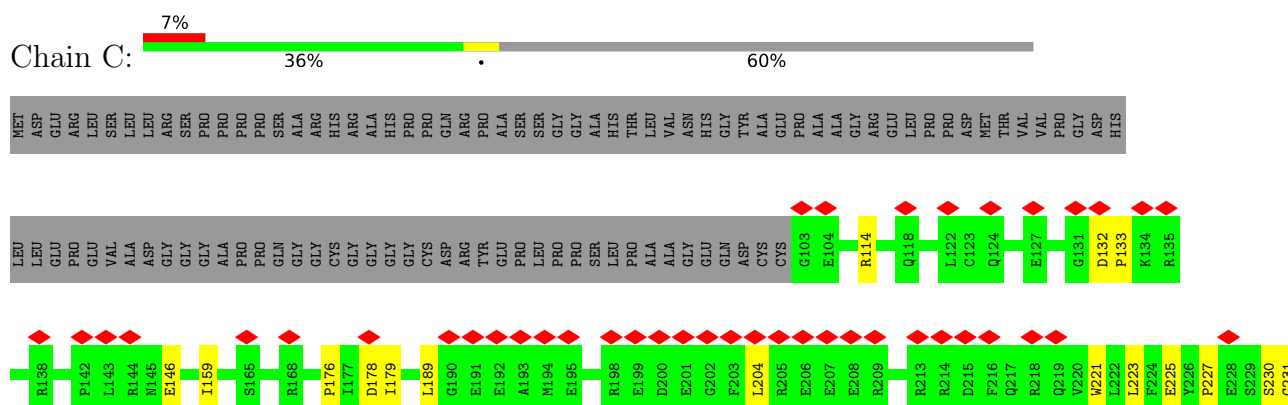
- Molecule 2 is POTASSIUM ION (CCD ID: K) (formula: K) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	AltConf
2	A	3	Total K 3 3	0

- Molecule 1: Potassium voltage-gated channel subfamily A member 3, Green fluorescent protein fusion



- Molecule 1: Potassium voltage-gated channel subfamily A member 3, Green fluorescent protein fusion



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

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

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

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	190793	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TITAN	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	54	Depositor
Minimum defocus (nm)	Not provided	
Maximum defocus (nm)	Not provided	
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	6.013	Depositor
Minimum map value	-4.621	Depositor
Average map value	0.005	Depositor
Map value standard deviation	0.092	Depositor
Recommended contour level	0.52	Depositor
Map size (Å)	272.64, 272.64, 272.64	wwPDB
Map dimensions	320, 320, 320	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	0.85200006, 0.85200006, 0.85200006	Depositor

5 Model quality

5.1 Standard geometry

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

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	0.54	0/2892	0.80	3/3919 (0.1%)
1	B	0.54	0/2892	0.80	3/3919 (0.1%)
1	C	0.54	0/2892	0.80	3/3919 (0.1%)
1	D	0.54	0/2892	0.80	3/3919 (0.1%)
All	All	0.54	0/11568	0.80	12/15676 (0.1%)

There are no bond length outliers.

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	433	ASP	N-CA-C	-6.22	106.65	114.56
1	A	433	ASP	N-CA-C	-6.22	106.67	114.56
1	D	433	ASP	N-CA-C	-6.21	106.67	114.56
1	C	433	ASP	N-CA-C	-6.21	106.67	114.56
1	B	452	PRO	N-CA-CB	-5.95	98.32	103.32
1	D	452	PRO	N-CA-CB	-5.93	98.34	103.32
1	A	452	PRO	N-CA-CB	-5.90	98.37	103.32
1	C	452	PRO	N-CA-CB	-5.89	98.37	103.32
1	B	451	HIS	CA-CB-CG	5.20	119.00	113.80
1	A	451	HIS	CA-CB-CG	5.19	118.99	113.80
1	D	451	HIS	CA-CB-CG	5.17	118.97	113.80
1	C	451	HIS	CA-CB-CG	5.15	118.95	113.80

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	2820	0	2858	18	0
1	B	2820	0	2858	22	0
1	C	2820	0	2858	21	0
1	D	2820	0	2858	19	0
2	A	3	0	0	0	0
All	All	11283	0	11432	69	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 3.

All (69) 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)
1:A:221:TRP:O	1:A:225:GLU:HB3	2.01	0.61
1:C:221:TRP:O	1:C:225:GLU:HB3	2.01	0.60
1:D:221:TRP:O	1:D:225:GLU:HB3	2.01	0.60
1:B:221:TRP:O	1:B:225:GLU:HB3	2.01	0.60
1:C:466:ILE:HD11	1:D:405:LEU:HD22	1.84	0.60
1:A:466:ILE:HD11	1:B:405:LEU:HD22	1.83	0.59
1:B:466:ILE:HD11	1:C:405:LEU:HD22	1.85	0.58
1:A:405:LEU:HD22	1:D:466:ILE:HD11	1.86	0.58
1:C:230:SER:OG	1:C:231:GLY:N	2.38	0.57
1:D:230:SER:OG	1:D:231:GLY:N	2.38	0.56
1:A:230:SER:OG	1:A:231:GLY:N	2.38	0.56
1:B:114:ARG:NH1	1:B:146:GLU:OE1	2.39	0.55
1:D:227:PRO:HA	1:D:233:ALA:HB1	1.89	0.55
1:A:227:PRO:HA	1:A:233:ALA:HB1	1.89	0.55
1:C:227:PRO:HA	1:C:233:ALA:HB1	1.89	0.55
1:C:418:PHE:HD2	1:D:368:LEU:HD13	1.72	0.55
1:B:418:PHE:HD2	1:C:368:LEU:HD13	1.72	0.54
1:C:114:ARG:NH1	1:C:146:GLU:OE1	2.40	0.54
1:B:227:PRO:HA	1:B:233:ALA:HB1	1.89	0.54
1:B:230:SER:OG	1:B:231:GLY:N	2.38	0.54
1:A:114:ARG:NH1	1:A:146:GLU:OE1	2.40	0.54
1:C:257:PRO:HA	1:C:260:ARG:HG2	1.90	0.53

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:257:PRO:HA	1:D:260:ARG:HG2	1.90	0.53
1:D:114:ARG:NH1	1:D:146:GLU:OE1	2.39	0.52
1:A:257:PRO:HA	1:A:260:ARG:HG2	1.90	0.52
1:B:257:PRO:HA	1:B:260:ARG:HG2	1.90	0.52
1:A:368:LEU:HD13	1:D:418:PHE:HD2	1.74	0.52
1:B:332:ASP:OD2	1:B:379:ARG:NH2	2.43	0.51
1:D:332:ASP:OD2	1:D:379:ARG:NH2	2.43	0.51
1:C:332:ASP:OD2	1:C:379:ARG:NH2	2.43	0.51
1:A:418:PHE:HD2	1:B:368:LEU:HD13	1.74	0.51
1:A:332:ASP:OD2	1:A:379:ARG:NH2	2.43	0.51
1:A:338:PRO:HA	1:A:341:ILE:HG12	1.96	0.48
1:D:338:PRO:HA	1:D:341:ILE:HG12	1.96	0.47
1:C:338:PRO:HA	1:C:341:ILE:HG12	1.96	0.47
1:B:338:PRO:HA	1:B:341:ILE:HG12	1.96	0.46
1:B:477:PRO:HA	1:B:480:VAL:HG22	1.98	0.46
1:C:477:PRO:HA	1:C:480:VAL:HG22	1.98	0.45
1:A:204:LEU:HD13	1:A:489:ARG:HD2	1.99	0.45
1:B:204:LEU:HD13	1:B:489:ARG:HD2	1.99	0.45
1:D:204:LEU:HD13	1:D:489:ARG:HD2	1.99	0.45
1:A:178:ASP:N	1:A:178:ASP:OD1	2.50	0.45
1:A:477:PRO:HA	1:A:480:VAL:HG22	1.98	0.45
1:C:178:ASP:N	1:C:178:ASP:OD1	2.50	0.45
1:C:204:LEU:HD13	1:C:489:ARG:HD2	1.99	0.45
1:D:477:PRO:HA	1:D:480:VAL:HG22	1.98	0.44
1:D:178:ASP:OD1	1:D:178:ASP:N	2.50	0.44
1:B:178:ASP:N	1:B:178:ASP:OD1	2.50	0.43
1:C:394:SER:OG	1:C:482:ASN:ND2	2.45	0.43
1:A:176:PRO:HD2	1:A:179:ILE:HD12	2.01	0.43
1:B:394:SER:OG	1:B:482:ASN:ND2	2.45	0.43
1:D:176:PRO:HD2	1:D:179:ILE:HD12	2.01	0.43
1:B:176:PRO:HD2	1:B:179:ILE:HD12	2.01	0.42
1:C:176:PRO:HD2	1:C:179:ILE:HD12	2.01	0.42
1:D:394:SER:OG	1:D:482:ASN:ND2	2.45	0.42
1:C:223:LEU:HD11	1:C:232:PRO:HB2	2.02	0.42
1:B:223:LEU:HD11	1:B:232:PRO:HB2	2.02	0.42
1:B:400:LEU:HD21	1:C:383:GLY:HA3	2.02	0.42
1:C:159:ILE:HD12	1:C:189:LEU:HD11	2.02	0.41
1:C:400:LEU:HD21	1:D:383:GLY:HA3	2.02	0.41
1:B:400:LEU:HD23	1:B:400:LEU:HA	1.92	0.41
1:D:223:LEU:HD11	1:D:232:PRO:HB2	2.02	0.41
1:A:159:ILE:HD12	1:A:189:LEU:HD11	2.02	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:400:LEU:HD21	1:B:383:GLY:HA3	2.02	0.41
1:A:223:LEU:HD11	1:A:232:PRO:HB2	2.02	0.41
1:D:159:ILE:HD12	1:D:189:LEU:HD11	2.02	0.41
1:C:132:ASP:HA	1:C:133:PRO:HD3	1.95	0.40
1:B:159:ILE:HD12	1:B:189:LEU:HD11	2.02	0.40
1:B:242:LEU:HD23	1:B:242:LEU:HA	1.91	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	340/856 (40%)	321 (94%)	19 (6%)	0	100	100
1	B	340/856 (40%)	321 (94%)	19 (6%)	0	100	100
1	C	340/856 (40%)	321 (94%)	19 (6%)	0	100	100
1	D	340/856 (40%)	321 (94%)	19 (6%)	0	100	100
All	All	1360/3424 (40%)	1284 (94%)	76 (6%)	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	307/724 (42%)	305 (99%)	2 (1%)	76	92
1	B	307/724 (42%)	305 (99%)	2 (1%)	76	92
1	C	307/724 (42%)	305 (99%)	2 (1%)	76	92
1	D	307/724 (42%)	305 (99%)	2 (1%)	76	92
All	All	1228/2896 (42%)	1220 (99%)	8 (1%)	73	92

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

Mol	Chain	Res	Type
1	A	374	ILE
1	A	452	PRO
1	B	374	ILE
1	B	452	PRO
1	C	374	ILE
1	C	452	PRO
1	D	374	ILE
1	D	452	PRO

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (2) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	389	GLN
1	D	389	GLN

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6 Ligand geometry

Of 3 ligands modelled in this entry, 3 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

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

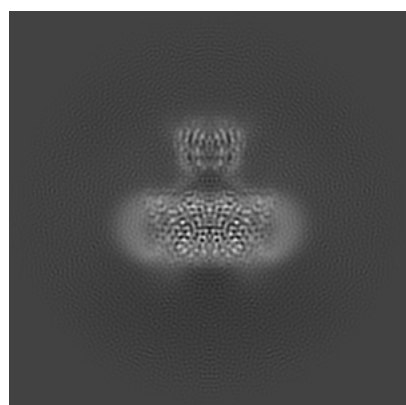
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-25416. These allow visual inspection of the internal detail of the map and identification of artifacts.

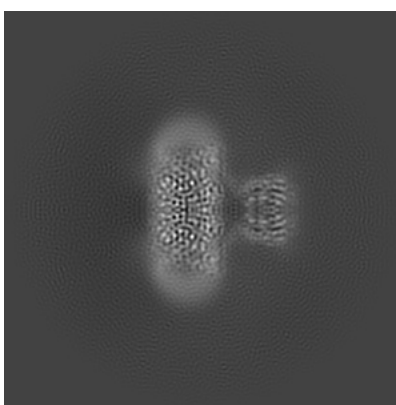
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

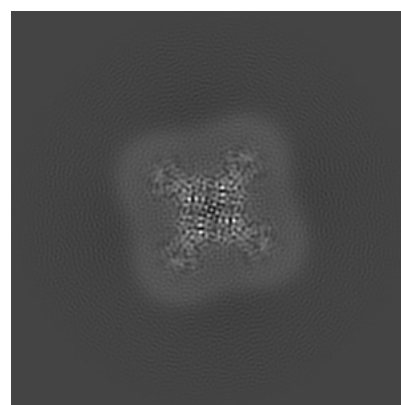
6.1.1 Primary map



X



Y

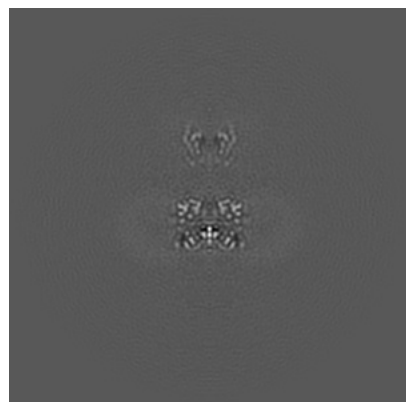


Z

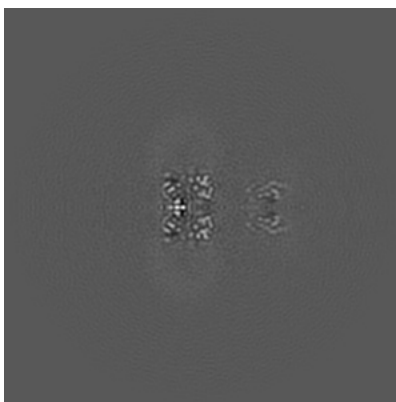
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

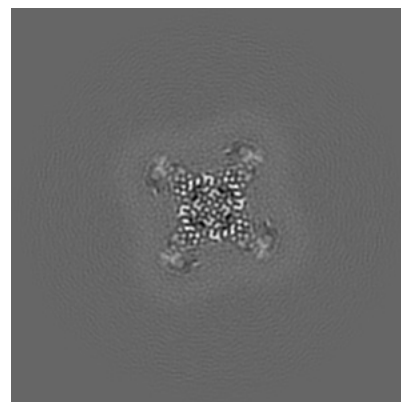
6.2.1 Primary map



X Index: 160



Y Index: 160

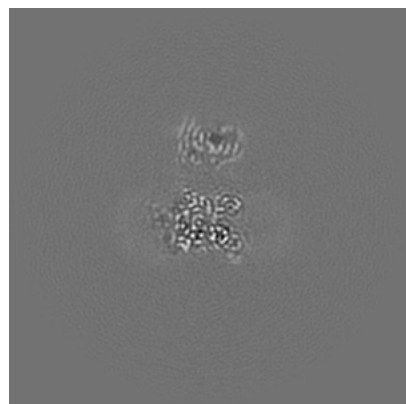


Z Index: 160

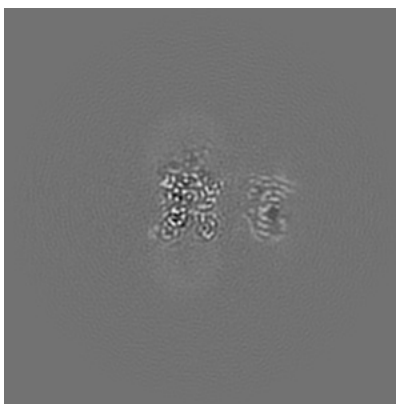
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

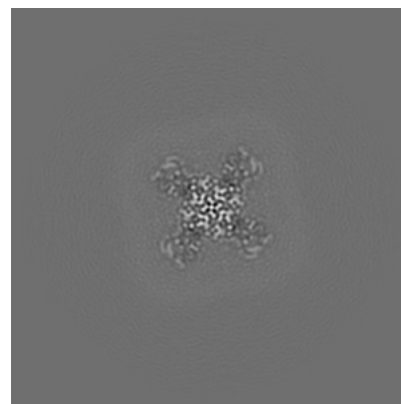
6.3.1 Primary map



X Index: 150



Y Index: 150

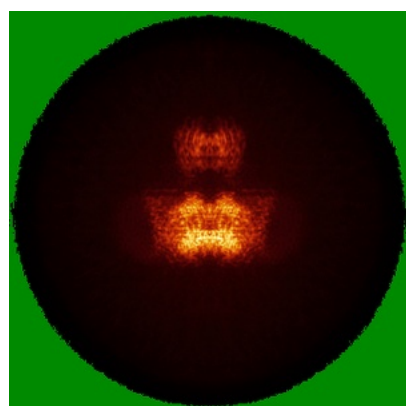


Z Index: 138

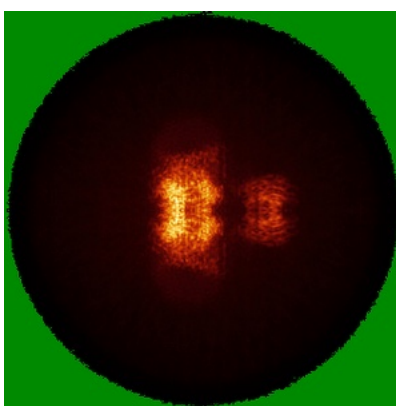
The images above show the largest variance slices of the map in three orthogonal directions.

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

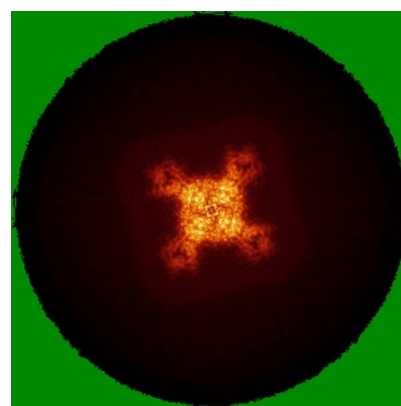
6.4.1 Primary map



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

This section was not generated.

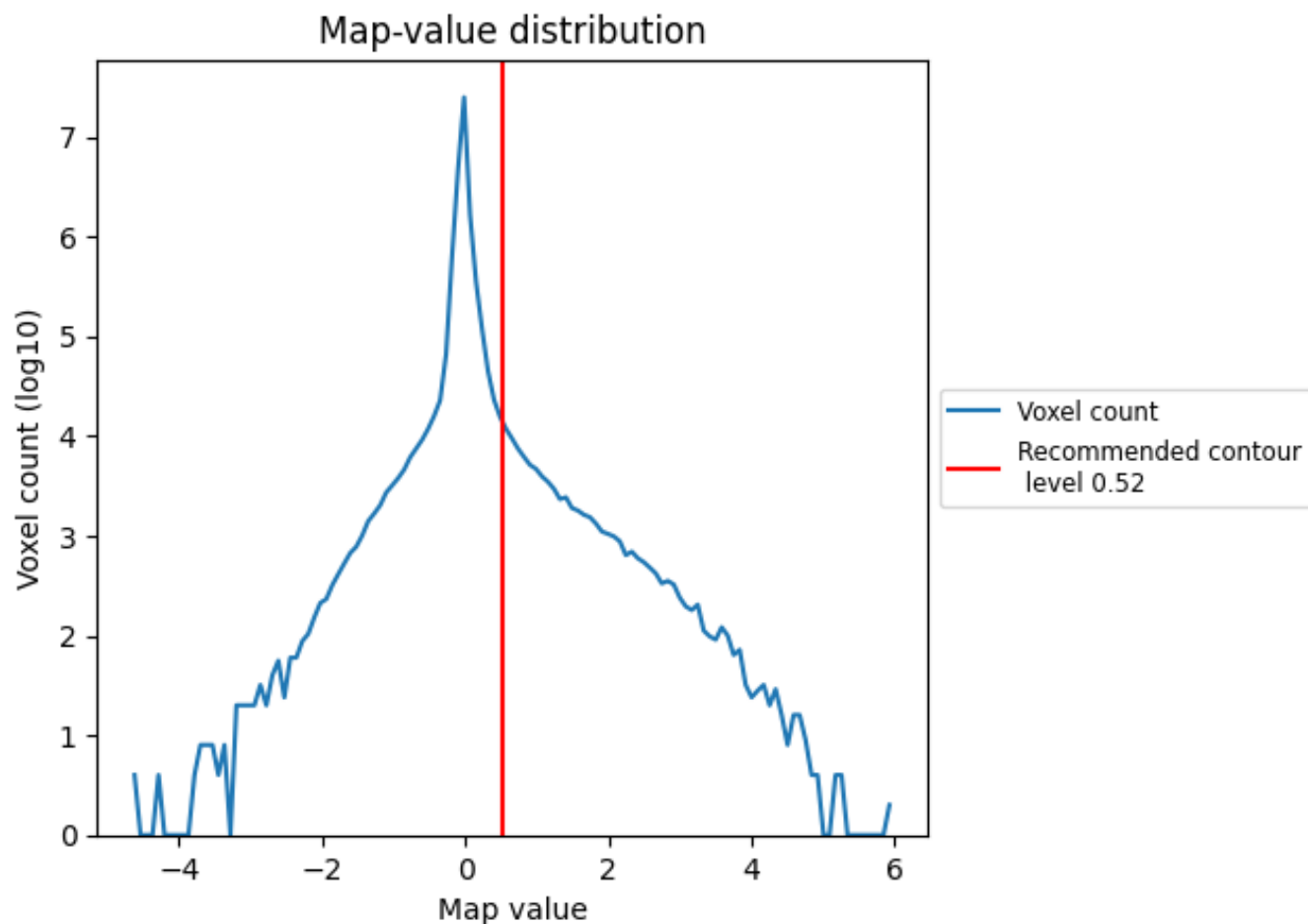
6.6 Mask visualisation

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

7 Map analysis [i](#)

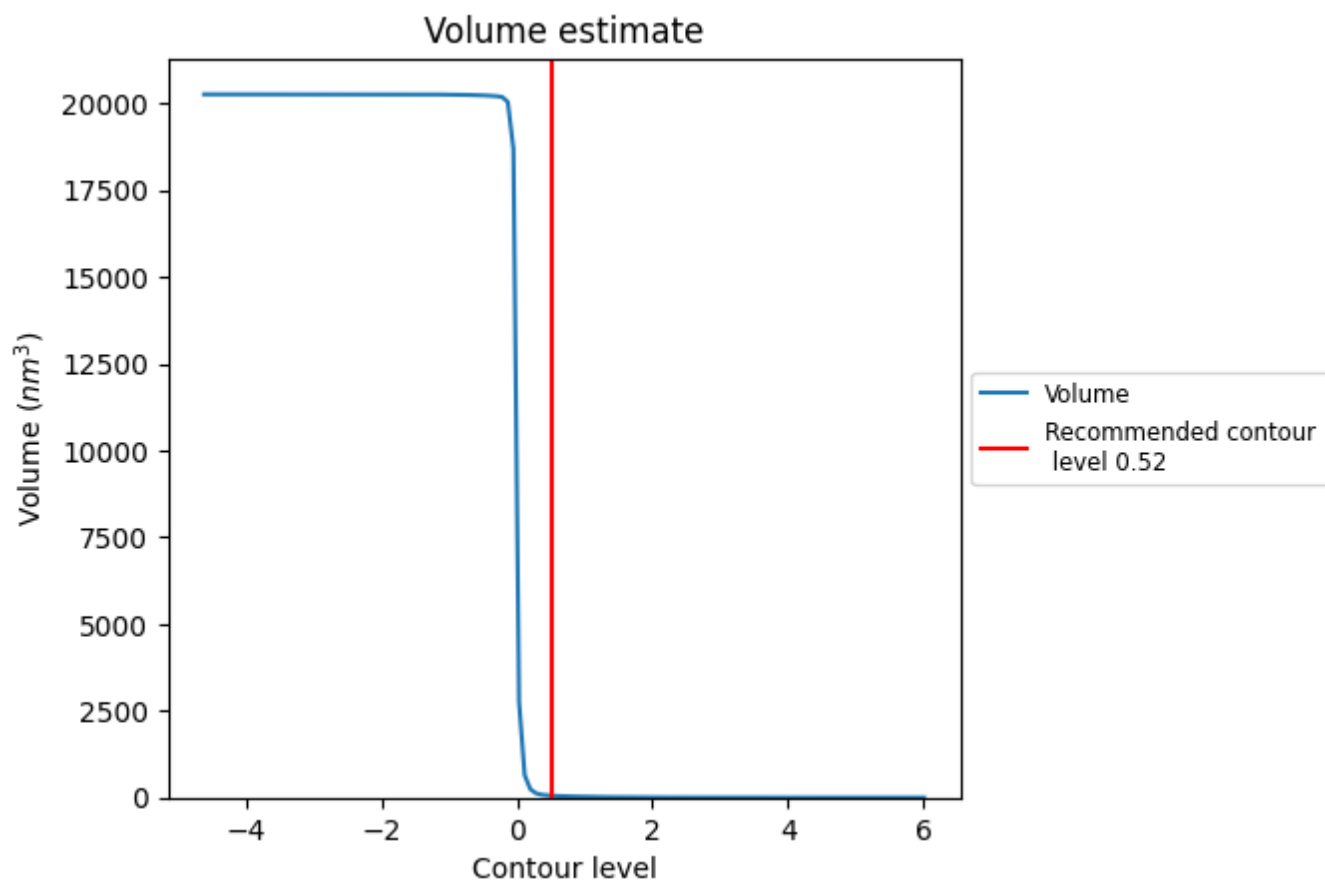
This section contains the results of statistical analysis of the map.

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.

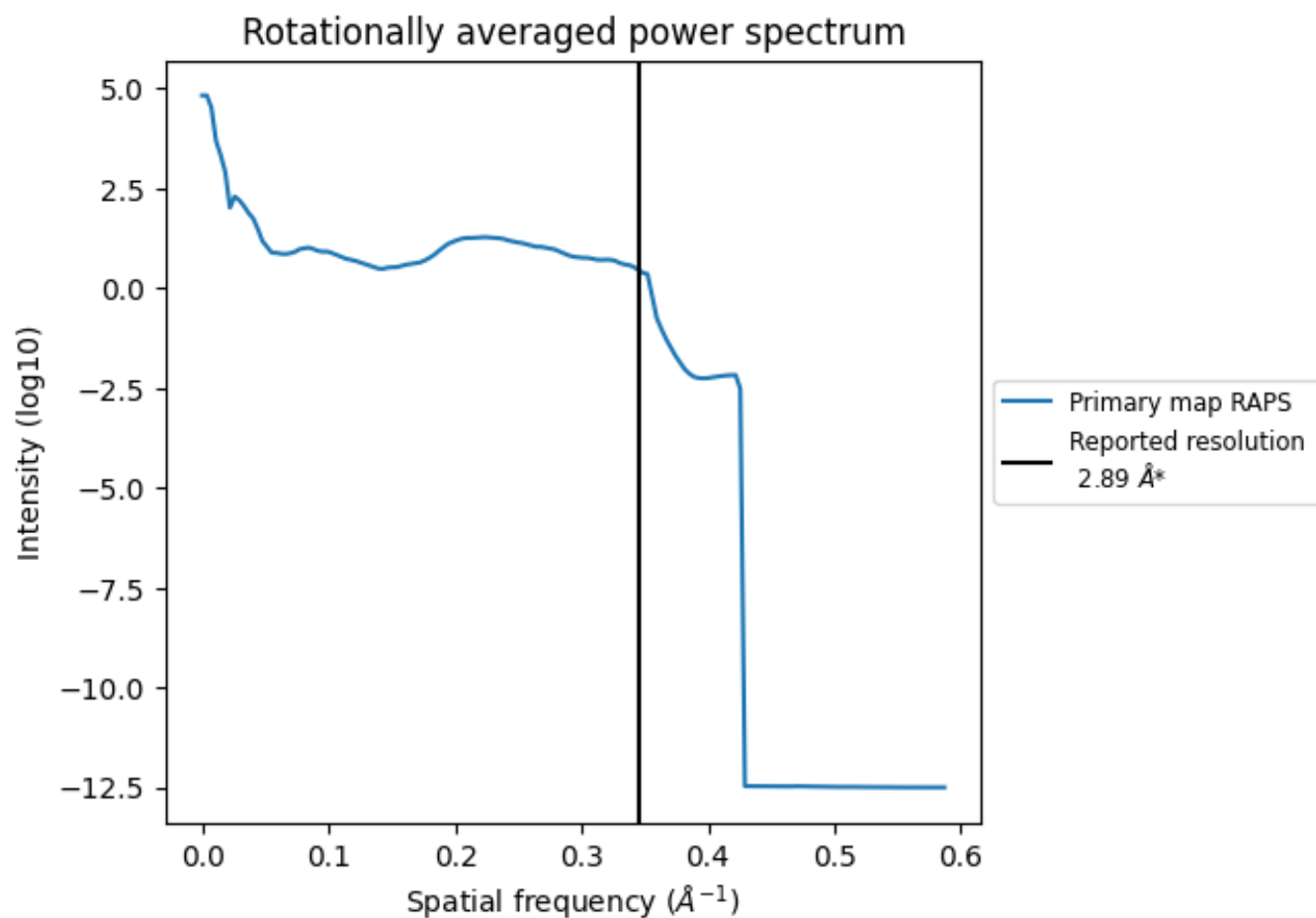
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 54 nm³; this corresponds to an approximate mass of 49 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 ⓘ

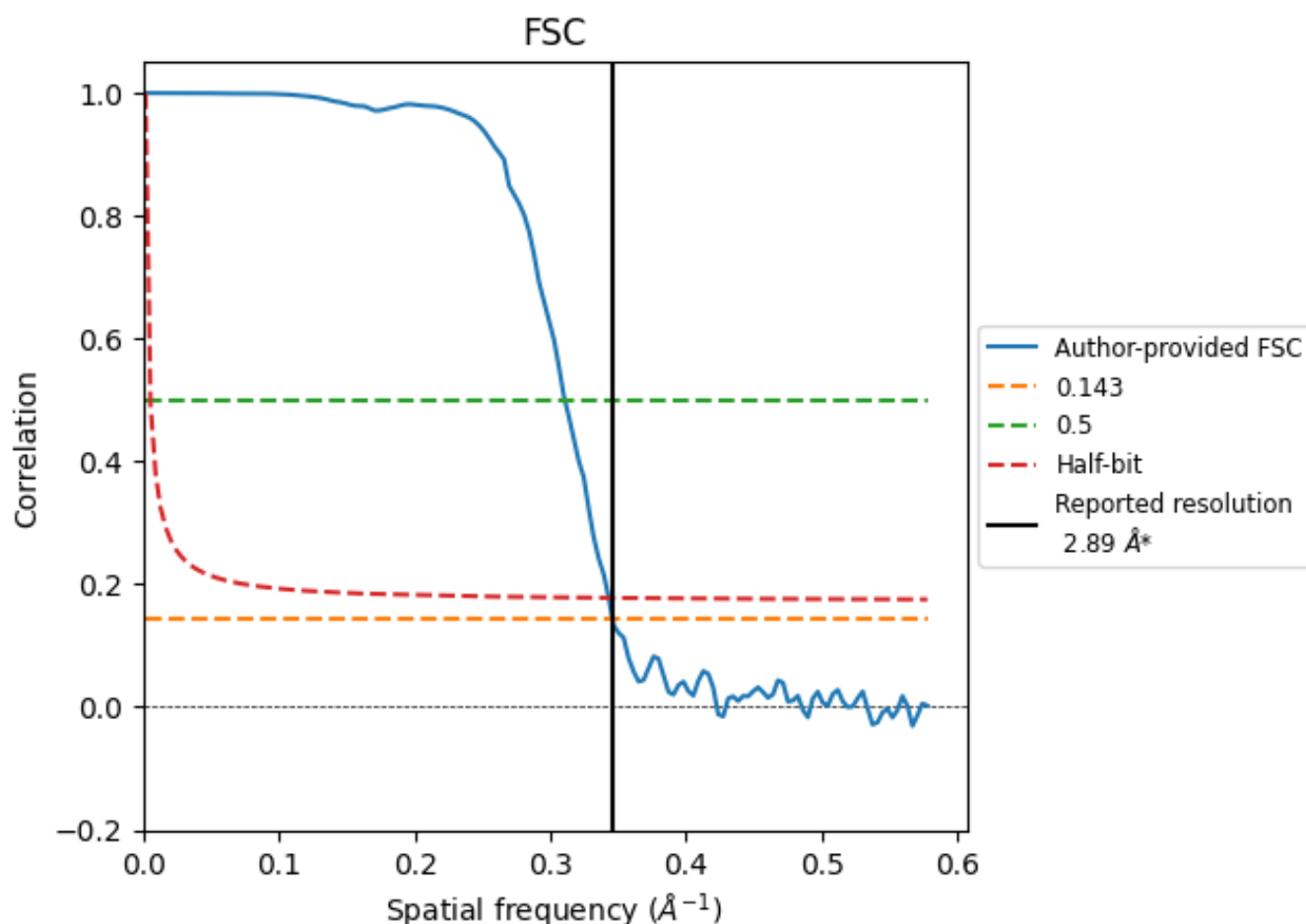


*Reported resolution corresponds to spatial frequency of 0.346 Å⁻¹

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 0.346 Å⁻¹

8.2 Resolution estimates [i](#)

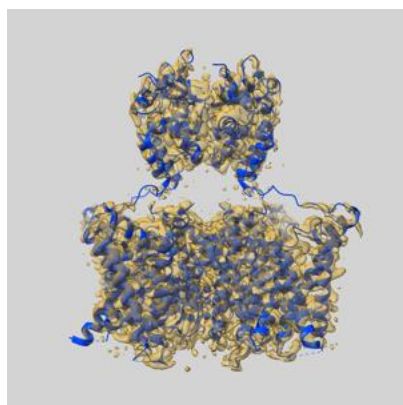
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	2.89	-	-
Author-provided FSC curve	2.89	3.22	2.92
Unmasked-calculated*	-	-	-

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

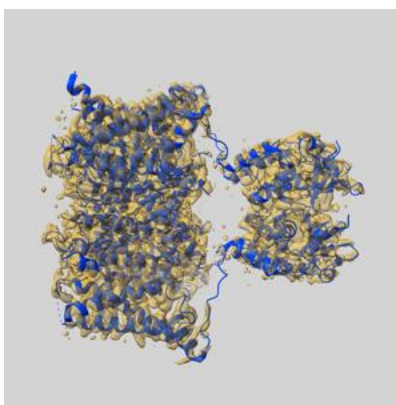
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-25416 and PDB model 7SSY. Per-residue inclusion information can be found in section [3](#) on page [9](#).

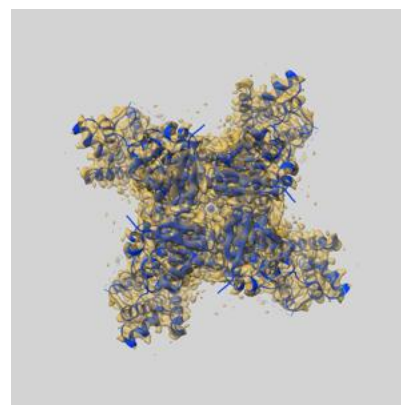
9.1 Map-model overlay [i](#)



X



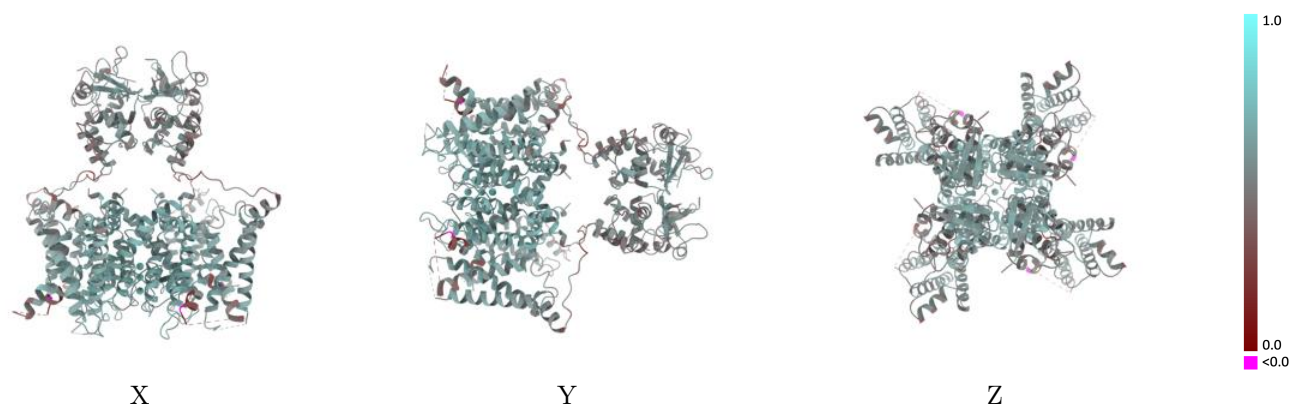
Y



Z

The images above show the 3D surface view of the map at the recommended contour level 0.52 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](#)

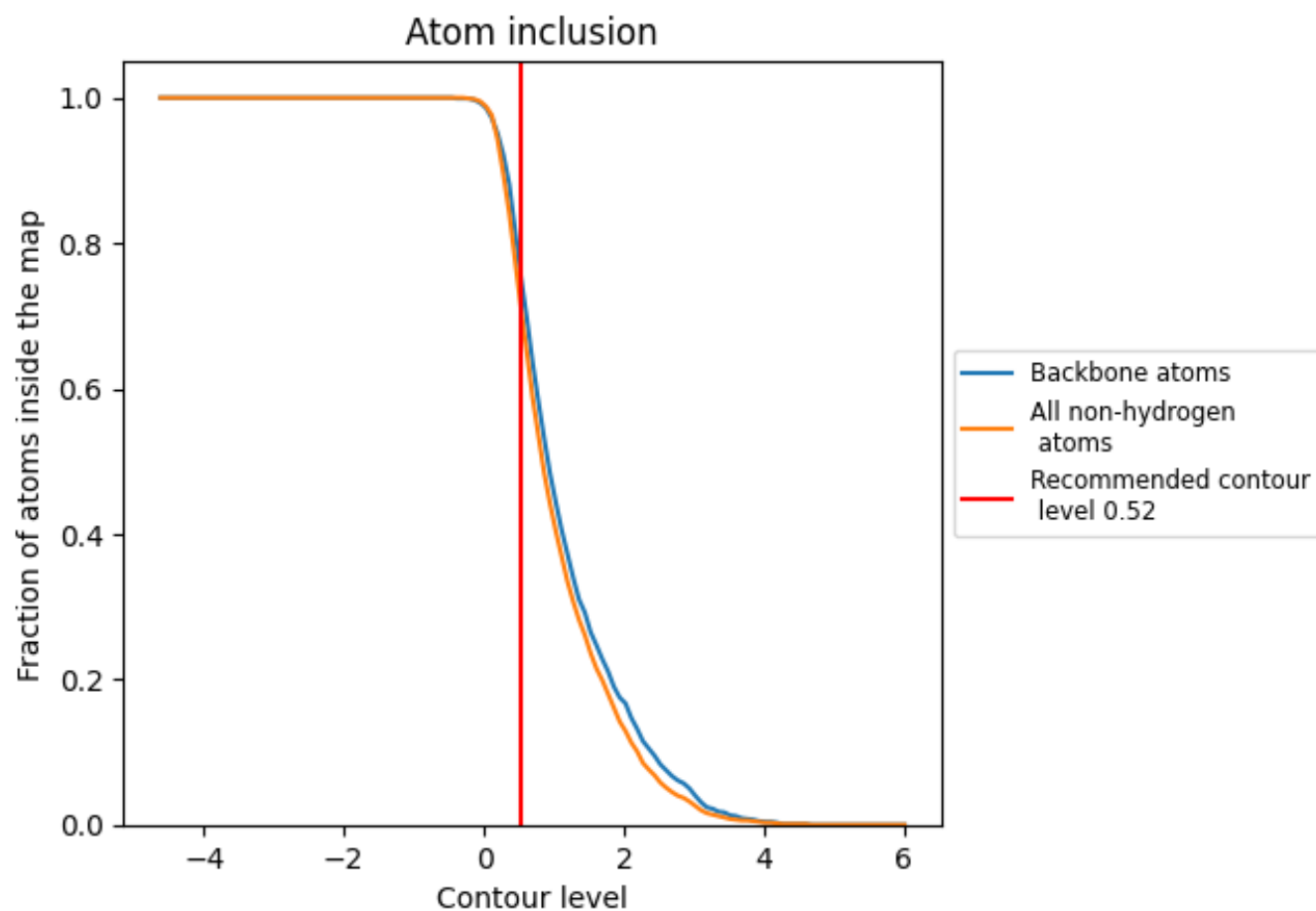


The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

This section was not generated.

9.4 Atom inclusion [i](#)



At the recommended contour level, 76% of all backbone atoms, 72% 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 (0.52) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7190	0.5480
A	0.7180	0.5480
B	0.7190	0.5490
C	0.7190	0.5480
D	0.7190	0.5480

