



# wwPDB EM Validation Summary Report ⓘ

Mar 5, 2026 – 08:49 PM UTC

PDB ID : 9IUS / pdb\_00009ius  
EMDB ID : EMD-60913  
Title : Structure of a hierarchical intermediate region (axiafirbil) of human collagen type  
Authors : Fang, B.H.; Zhang, L.J.  
Deposited on : 2024-07-22  
Resolution : 9.80 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.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

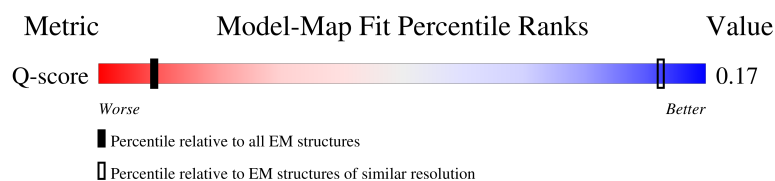
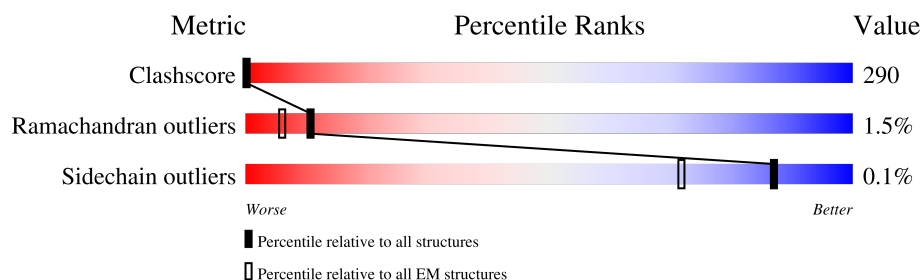
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*


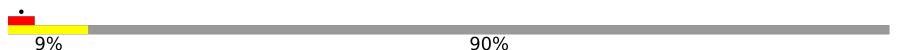
The reported resolution of this entry is 9.80 Å.

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	157 ( 9.30 - 10.30 )

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.

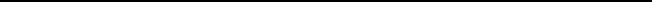
Mol	Chain	Length	Quality of chain
1	1	780	
1	2	780	
1	3	780	
1	4	780	

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Mol	Chain	Length	Quality of chain	
1	A	780		91%
1	B	780		91%
1	C	780		90%
1	D	780		91%
1	E	780		90%
1	F	780		90%
1	G	780		91%
1	H	780		91%
1	I	780		91%
1	J	780		90%
1	K	780		91%
1	L	780		91%
1	M	780		91%
1	N	780		91%
1	O	780		91%
1	P	780		92%
1	Q	780		91%
1	R	780		91%
1	S	780		91%
1	T	780		91%
1	U	780		90%
1	V	780		90%
1	W	780		90%
1	X	780		90%
1	Y	780		91%

*Continued on next page...*

Mol	Chain	Length	Quality of chain
1	Z	780	

## 2 Entry composition [i](#)

There is only 1 type of molecule in this entry. The entry contains 15288 atoms, of which 2476 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 axialfibril.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	X	75	Total	C	H	N	O	0	0
			525	265	85	85	90		
1	A	73	Total	C	H	N	O	0	0
			514	260	83	83	88		
1	B	72	Total	C	H	N	O	0	0
			507	255	83	82	87		
1	C	75	Total	C	H	N	O	0	0
			525	265	85	85	90		
1	D	74	Total	C	H	N	O	0	0
			519	262	84	84	89		
1	E	75	Total	C	H	N	O	0	0
			525	265	85	85	90		
1	F	75	Total	C	H	N	O	0	0
			525	265	85	85	90		
1	G	71	Total	C	H	N	O	0	0
			493	249	79	80	85		
1	H	71	Total	C	H	N	O	0	0
			493	249	79	80	85		
1	I	73	Total	C	H	N	O	0	0
			513	258	84	83	88		
1	J	75	Total	C	H	N	O	0	0
			525	265	85	85	90		
1	K	73	Total	C	H	N	O	0	0
			513	258	84	83	88		
1	L	73	Total	C	H	N	O	0	0
			513	258	84	83	88		
1	M	71	Total	C	H	N	O	0	0
			501	252	82	81	86		
1	N	72	Total	C	H	N	O	0	0
			507	255	83	82	87		
1	O	70	Total	C	H	N	O	0	0
			493	247	81	80	85		
1	P	66	Total	C	H	N	O	0	0
			463	232	76	75	80		

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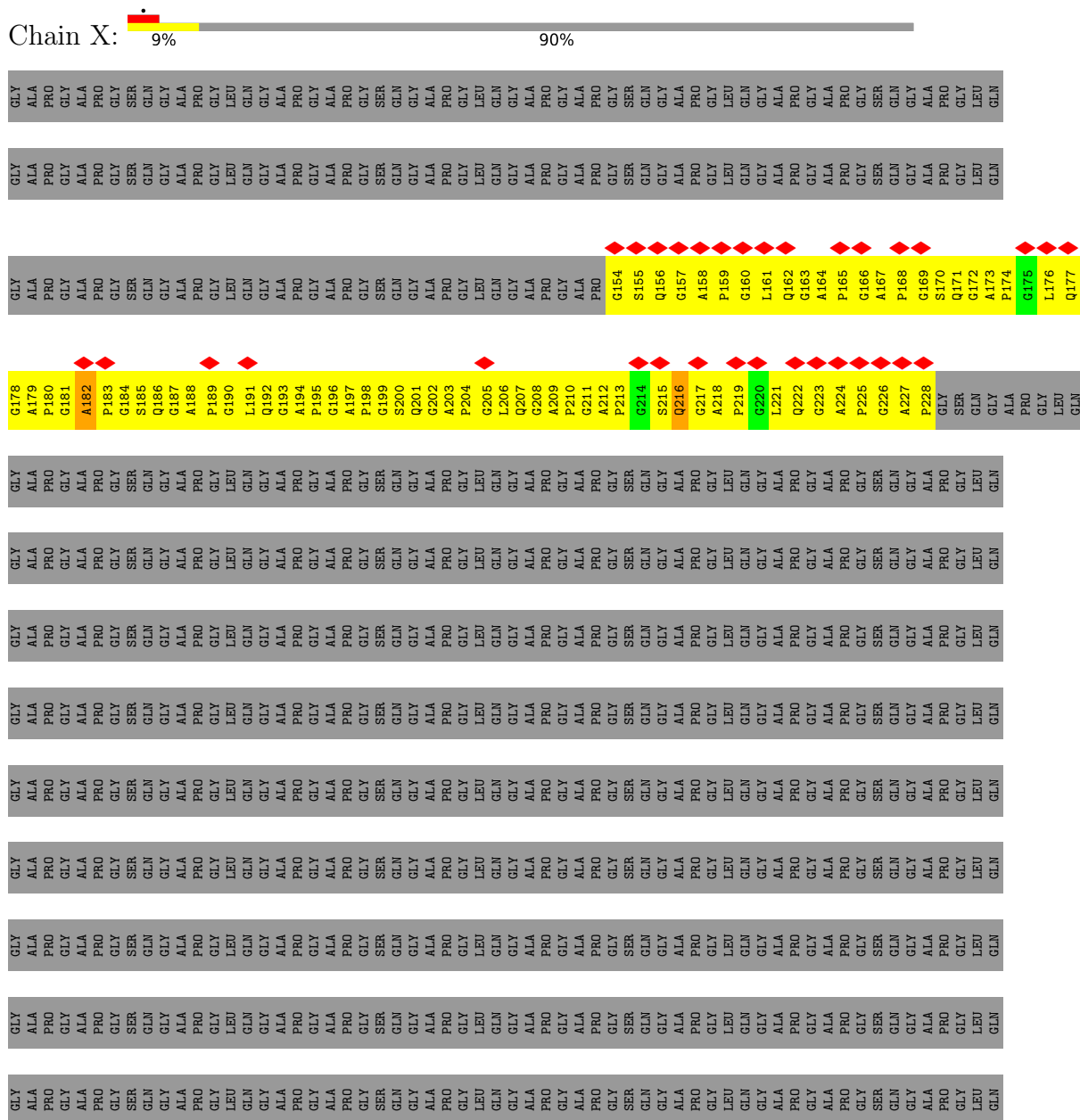
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Mol	Chain	Residues	Atoms					AltConf	Trace
1	Q	70	Total 486	C 244	H 79	N 79	O 84	0	0
1	Y	70	Total 487	C 247	H 78	N 79	O 83	0	0
1	Z	72	Total 507	C 255	H 83	N 82	O 87	0	0
1	1	71	Total 495	C 250	H 80	N 80	O 85	0	0
1	2	74	Total 517	C 262	H 83	N 84	O 88	0	0
1	3	74	Total 520	C 263	H 84	N 84	O 89	0	0
1	4	75	Total 525	C 265	H 85	N 85	O 90	0	0
1	R	70	Total 487	C 247	H 78	N 79	O 83	0	0
1	S	71	Total 502	C 253	H 82	N 81	O 86	0	0
1	T	72	Total 502	C 255	H 80	N 81	O 86	0	0
1	U	77	Total 537	C 272	H 86	N 87	O 92	0	0
1	V	76	Total 532	C 270	H 85	N 86	O 91	0	0
1	W	77	Total 537	C 272	H 86	N 87	O 92	0	0

### 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: axialfibril



[illegible][illegible]





- Molecule 1: axialfibril



[illegible]

- Molecule 1: axialfibril

Chain E:  9% 90%

[illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible]

- Molecule 1: axialfibril

Chain F: 

[illegible]















Chain N:  8% 91%

Chain O:  8% 91%





[illegible]

- Molecule 1: axialfibril

[illegible]





[illegible]

- Molecule 1: axialfibril

Chain 3:   
Chain 3: • 8% 91%

[illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible]

- Molecule 1: axialfibril

Chain 4: 

GLY	ALA	PRO	PRO	GLY	ALA	ALA	PRO	GLY	SER	GLN	GLY	ALA	PRO	GLY	LEU	GLN	ALA	ALA	PRO	PRO	GLY	GLY	SER	GLN	GLY	ALA	ALA	PRO	PRO	GLY	GLY	GLN	GLN	GLY	LEU
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Chain R:  8% 91%

[illegible]

- Molecule 1: axialfibril

Chain S:  9% 91%

[illegible]

G178	A179	P180	G181	A182	P183	G184	S185	G186	P187	A188	P189	G190	G191	A192	G193	A194	G195	G196	A197	P198	G199	S200	G201	G202	A203	P204	G205	G206	G207	G208	A209	P210	G211	A212	P213	G214	S215	G216	G217	A218	P219	G220	G221	G222	G223	A224	G225	G226	A227	P228	G229	S230	G231	G232	A233	P234	G235	L236
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[illegible][illegible][illegible][illegible][illegible]

[illegible]

- Molecule 1: axialfibril

[illegible]

Downloaded from <http://ajphaphysocpharm.sagepub.com/> at 11:06 11 September 2014

G178	G179	G180	G181	G182	G183	G184	G185	G186	G187	G188	G189	G190	G191	G192	G193	G194	G195	G196	G197	G198	G199	G200	G201	G202	G203	G204	G205	G206	G207	G208	G209	G210	G211	G212	G213	G214	G215	G216	G217	G218	G219	G220	G221	G222	G223	G224	G225	G226	G227	G228	G229	G230	G231	G232	G233	G234	G235	G236	G237	G238	G239	G240	G241	G242	G243	G244	G245	G246	G247	G248	G249	G250	G251	G252	G253	G254	G255	G256	G257	G258	G259	G260	G261	G262	G263	G264	G265	G266	G267	G268	G269	G270	G271	G272	G273	G274	G275	G276	G277	G278	G279	G280	G281	G282	G283	G284	G285	G286	G287	G288	G289	G290	G291	G292	G293	G294	G295	G296	G297	G298	G299	G300	G301	G302	G303	G304	G305	G306	G307	G308	G309	G310	G311	G312	G313	G314	G315	G316	G317	G318	G319	G320	G321	G322	G323	G324	G325	G326	G327	G328	G329	G330	G331	G332	G333	G334	G335	G336	G337	G338	G339	G340	G341	G342	G343	G344	G345	G346	G347	G348	G349	G350	G351	G352	G353	G354	G355	G356	G357	G358	G359	G360	G361	G362	G363	G364	G365	G366	G367	G368	G369	G370	G371	G372	G373	G374	G375	G376	G377	G378	G379	G380	G381	G382	G383	G384	G385	G386	G387	G388	G389	G390	G391	G392	G393	G394	G395	G396	G397	G398	G399	G400	G401	G402	G403	G404	G405	G406	G407	G408	G409	G410	G411	G412	G413	G414	G415	G416	G417	G418	G419	G420	G421	G422	G423	G424	G425	G426	G427	G428	G429	G430	G431	G432	G433	G434	G435	G436	G437	G438	G439	G440	G441	G442	G443	G444	G445	G446	G447	G448	G449	G450	G451	G452	G453	G454	G455	G456	G457	G458	G459	G460	G461	G462	G463	G464	G465	G466	G467	G468	G469	G470	G471	G472	G473	G474	G475	G476	G477	G478	G479	G480	G481	G482	G483	G484	G485	G486	G487	G488	G489	G490	G491	G492	G493	G494	G495	G496	G497	G498	G499	G500	G501	G502	G503	G504	G505	G506	G507	G508	G509	G510	G511	G512	G513	G514	G515	G516	G517	G518	G519	G520	G521	G522	G523	G524	G525	G526	G527	G528	G529	G530	G531	G532	G533	G534	G535	G536	G537	G538	G539	G540	G541	G542	G543	G544	G545	G546	G547	G548	G549	G550	G551	G552	G553	G554	G555	G556	G557	G558	G559	G560	G561	G562	G563	G564	G565	G566	G567	G568	G569	G570	G571	G572	G573	G574	G575	G576	G577	G578	G579	G580	G581	G582	G583	G584	G585	G586	G587	G588	G589	G590	G591	G592	G593	G594	G595	G596	G597	G598	G599	G600	G601	G602	G603	G604	G605	G606	G607	G608	G609	G610	G611	G612	G613	G614	G615	G616	G617	G618	G619	G620	G621	G622	G623	G624	G625	G626	G627	G628	G629	G630	G631	G632	G633	G634	G635	G636	G637	G638	G639	G640	G641	G642	G643	G644	G645	G646	G647	G648	G649	G650	G651	G652	G653	G654	G655	G656	G657	G658	G659	G660	G661	G662	G663	G664	G665	G666	G667	G668	G669	G670	G671	G672	G673	G674	G675	G676	G677	G678	G679	G680	G681	G682	G683	G684	G685	G686	G687	G688	G689	G690	G691	G692	G693	G694	G695	G696	G697	G698	G699	G700	G701	G702	G703	G704	G705	G706	G707	G708	G709	G710	G711	G712	G713	G714	G715	G716	G717	G718	G719	G720	G721	G722	G723	G724	G725	G726	G727	G728	G729	G730	G731	G732	G733	G734	G735	G736	G737	G738	G739	G740	G741	G742	G743	G744	G745	G746	G747	G748	G749	G750	G751	G752	G753	G754	G755	G756	G757	G758	G759	G760	G761	G762	G763	G764	G765	G766	G767	G768	G769	G770	G771	G772	G773	G774	G775	G776	G777	G778	G779	G780	G781	G782	G783	G784	G785	G786	G787	G788	G789	G790	G791	G792	G793	G794	G795	G796	G797	G798	G799	G800	G801	G802	G803	G804	G805	G806	G807	G808	G809	G810	G811	G812	G813	G814	G815	G816	G817	G818	G819	G820	G821	G822	G823	G824	G825	G826	G827	G828	G829	G830	G831	G832	G833	G834	G835	G836	G837	G838	G839	G840	G841	G842	G843	G844	G845	G846	G847	G848	G849	G850	G851	G852	G853	G854	G855	G856	G857	G858	G859	G860	G861	G862	G863	G864	G865	G866	G867	G868	G869	G870	G871	G872	G873	G874	G875	G876	G877	G878	G879	G880	G881	G882	G883	G884	G885	G886	G887	G888	G889	G890	G891	G892	G893	G894	G895	G896	G897	G898	G899	G900	G901	G902	G903	G904	G905	G906	G907	G908	G909	G910	G911	G912	G913	G914	G915	G916	G917	G918	G919	G920	G921	G922	G923	G924	G925	G926	G927	G928	G929	G930	G931	G932	G933	G934	G935	G936	G937	G938	G939	G940	G941	G942	G943	G944	G945	G946	G947	G948	G949	G950	G951	G952	G953	G954	G955	G956	G957	G958	G959	G960	G961	G962	G963	G964	G965	G966	G967	G968	G969	G970	G971	G972	G973	G974	G975	G976	G977	G978	G979	G980	G981	G982	G983	G984	G985	G986	G987	G988	G989	G990	G991	G992	G993	G994	G995	G996	G997	G998	G999	G1000
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[illegible][illegible][illegible]

*(continued)*

[illegible]

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[illegible]

- Molecule 1: axialfibril

- Molecule 1: axialfibril

Response	Percentage
Yes	9%
No	90%

- Molecule 1: axialfibril

Response	Percentage
Current government is responsible	8%
Other	90%

[illegible]



[illegible]

## 4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	40485	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TALOS ARCTICA	Depositor
Voltage (kV)	200	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	40	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2800	Depositor
Magnification	Not provided	
Image detector	FEI FALCON III (4k x 4k)	Depositor
Maximum map value	2.296	Depositor
Minimum map value	-0.878	Depositor
Average map value	0.021	Depositor
Map value standard deviation	0.172	Depositor
Recommended contour level	0.97	Depositor
Map size (Å)	216.00002, 216.00002, 216.00002	wwPDB
Map dimensions	180, 180, 180	wwPDB
Map angles (°)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (Å)	1.2, 1.2, 1.2	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	1	0.22	0/428	0.75	2/586 (0.3%)
1	2	0.22	0/448	0.45	0/614
1	3	0.19	0/450	0.40	0/617
1	4	0.20	0/454	0.50	0/622
1	A	0.16	0/445	0.38	0/609
1	B	0.18	0/437	0.44	0/598
1	C	0.16	0/454	0.41	0/621
1	D	0.16	0/449	0.37	0/614
1	E	0.17	0/454	0.39	0/622
1	F	0.20	0/454	0.46	0/622
1	G	0.17	0/428	0.33	0/586
1	H	0.17	0/428	0.39	0/586
1	I	0.14	0/442	0.35	0/605
1	J	0.17	0/454	0.43	0/622
1	K	0.20	0/442	0.46	0/605
1	L	0.19	0/442	0.70	2/605 (0.3%)
1	M	0.21	0/432	0.51	0/590
1	N	0.17	0/437	0.42	0/598
1	O	0.14	0/425	0.37	0/582
1	P	0.17	0/399	0.45	0/546
1	Q	0.20	0/420	0.38	0/575
1	R	0.18	0/422	0.49	0/578
1	S	0.18	0/433	0.41	0/593
1	T	0.19	0/436	0.46	0/597
1	U	0.21	0/466	0.49	0/638
1	V	0.17	0/462	0.48	0/633
1	W	0.22	0/466	0.47	0/638
1	X	0.19	0/454	0.47	0/622
1	Y	0.22	0/422	0.59	0/578
1	Z	0.26	0/437	0.52	0/598
All	All	0.19	0/13220	0.47	4/18100 (0.0%)

There are no bond length outliers.



All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	1	249	PRO	CA-C-N	9.73	140.82	121.93
1	1	249	PRO	C-N-CA	9.73	140.82	121.93
1	L	234	PRO	CA-C-N	9.44	137.76	120.87
1	L	234	PRO	C-N-CA	9.44	137.76	120.87

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	1	415	80	391	524	0
1	2	434	83	409	460	0
1	3	436	84	411	394	0
1	4	440	85	414	481	0
1	A	431	83	407	453	0
1	B	424	83	399	382	0
1	C	440	85	415	415	0
1	D	435	84	410	452	0
1	E	440	85	414	435	0
1	F	440	85	414	450	0
1	G	414	79	388	425	0
1	H	414	79	388	423	0
1	I	429	84	404	452	0
1	J	440	85	414	517	0
1	K	429	84	404	540	0
1	L	429	84	404	477	0
1	M	419	82	395	466	0
1	N	424	83	399	387	0
1	O	412	81	385	380	0
1	P	387	76	362	415	0
1	Q	407	79	380	367	0
1	R	409	78	386	490	0
1	S	420	82	396	403	0
1	T	422	80	399	439	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	U	451	86	425	468	0
1	V	447	85	422	388	0
1	W	451	86	425	385	0
1	X	440	85	414	432	0
1	Y	409	78	386	602	0
1	Z	424	83	399	553	0
All	All	12812	2476	12059	7217	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 290.

The worst 5 of 7217 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:225:PRO:HA	1:4:274:GLY:HA3	1.21	1.21
1:X:190:GLY:HA3	1:B:191:LEU:HA	1.22	1.20
1:X:225:PRO:HG3	1:A:219:PRO:HB2	1.24	1.18
1:A:219:PRO:HG2	1:I:253:GLY:HA3	1.20	1.17
1:Y:257:ALA:HB2	1:1:257:ALA:HB1	1.25	1.17

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	1	69/780 (9%)	38 (55%)	31 (45%)	0	100	100
1	2	72/780 (9%)	34 (47%)	38 (53%)	0	100	100
1	3	72/780 (9%)	51 (71%)	20 (28%)	1 (1%)	9	40
1	4	73/780 (9%)	41 (56%)	30 (41%)	2 (3%)	4	25
1	A	71/780 (9%)	44 (62%)	27 (38%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	70/780 (9%)	47 (67%)	22 (31%)	1 (1%)	9	40
1	C	73/780 (9%)	45 (62%)	27 (37%)	1 (1%)	9	40
1	D	72/780 (9%)	47 (65%)	24 (33%)	1 (1%)	9	40
1	E	73/780 (9%)	48 (66%)	23 (32%)	2 (3%)	4	25
1	F	73/780 (9%)	29 (40%)	43 (59%)	1 (1%)	9	40
1	G	69/780 (9%)	39 (56%)	30 (44%)	0	100	100
1	H	69/780 (9%)	37 (54%)	32 (46%)	0	100	100
1	I	71/780 (9%)	56 (79%)	15 (21%)	0	100	100
1	J	73/780 (9%)	39 (53%)	33 (45%)	1 (1%)	9	40
1	K	71/780 (9%)	42 (59%)	29 (41%)	0	100	100
1	L	71/780 (9%)	43 (61%)	25 (35%)	3 (4%)	2	17
1	M	69/780 (9%)	42 (61%)	25 (36%)	2 (3%)	3	23
1	N	70/780 (9%)	42 (60%)	28 (40%)	0	100	100
1	O	68/780 (9%)	43 (63%)	24 (35%)	1 (2%)	8	40
1	P	64/780 (8%)	41 (64%)	23 (36%)	0	100	100
1	Q	68/780 (9%)	50 (74%)	18 (26%)	0	100	100
1	R	68/780 (9%)	45 (66%)	21 (31%)	2 (3%)	3	23
1	S	69/780 (9%)	35 (51%)	34 (49%)	0	100	100
1	T	70/780 (9%)	32 (46%)	37 (53%)	1 (1%)	9	40
1	U	75/780 (10%)	39 (52%)	33 (44%)	3 (4%)	2	18
1	V	74/780 (10%)	43 (58%)	29 (39%)	2 (3%)	4	25
1	W	75/780 (10%)	42 (56%)	30 (40%)	3 (4%)	2	18
1	X	73/780 (9%)	41 (56%)	30 (41%)	2 (3%)	4	25
1	Y	68/780 (9%)	41 (60%)	25 (37%)	2 (3%)	3	23
1	Z	70/780 (9%)	43 (61%)	27 (39%)	0	100	100
All	All	2123/23400 (9%)	1259 (59%)	833 (39%)	31 (2%)	11	40

5 of 31 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	X	182	ALA
1	X	216	GLN
1	C	179	ALA

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Mol	Chain	Res	Type
1	E	194	ALA
1	F	194	ALA

### 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	1	33/364 (9%)	33 (100%)	0	100	100
1	2	34/364 (9%)	34 (100%)	0	100	100
1	3	35/364 (10%)	35 (100%)	0	100	100
1	4	35/364 (10%)	35 (100%)	0	100	100
1	A	35/364 (10%)	35 (100%)	0	100	100
1	B	34/364 (9%)	34 (100%)	0	100	100
1	C	35/364 (10%)	35 (100%)	0	100	100
1	D	35/364 (10%)	35 (100%)	0	100	100
1	E	35/364 (10%)	35 (100%)	0	100	100
1	F	35/364 (10%)	35 (100%)	0	100	100
1	G	33/364 (9%)	33 (100%)	0	100	100
1	H	33/364 (9%)	33 (100%)	0	100	100
1	I	34/364 (9%)	34 (100%)	0	100	100
1	J	35/364 (10%)	35 (100%)	0	100	100
1	K	34/364 (9%)	34 (100%)	0	100	100
1	L	34/364 (9%)	34 (100%)	0	100	100
1	M	34/364 (9%)	34 (100%)	0	100	100
1	N	34/364 (9%)	34 (100%)	0	100	100
1	O	33/364 (9%)	32 (97%)	1 (3%)	36	57
1	P	31/364 (8%)	31 (100%)	0	100	100
1	Q	32/364 (9%)	32 (100%)	0	100	100
1	R	32/364 (9%)	32 (100%)	0	100	100

*Continued on next page...*

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	S	34/364 (9%)	34 (100%)	0	100	100
1	T	34/364 (9%)	34 (100%)	0	100	100
1	U	36/364 (10%)	36 (100%)	0	100	100
1	V	36/364 (10%)	36 (100%)	0	100	100
1	W	36/364 (10%)	36 (100%)	0	100	100
1	X	35/364 (10%)	35 (100%)	0	100	100
1	Y	32/364 (9%)	32 (100%)	0	100	100
1	Z	34/364 (9%)	34 (100%)	0	100	100
All	All	1022/10920 (9%)	1021 (100%)	1 (0%)	87	89

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	O	162	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 37 such sidechains are listed below:

Mol	Chain	Res	Type
1	4	261	GLN
1	V	237	GLN
1	R	222	GLN
1	S	246	GLN
1	I	237	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 [i](#)

There are no ligands in this entry.

## 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.

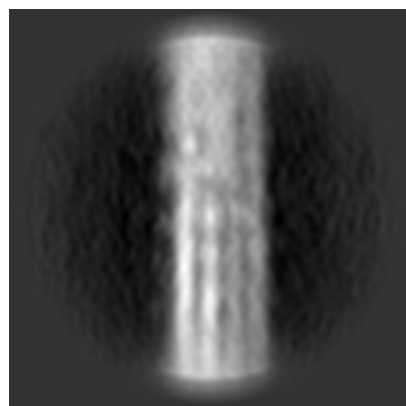
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-60913. These allow visual inspection of the internal detail of the map and identification of artifacts.

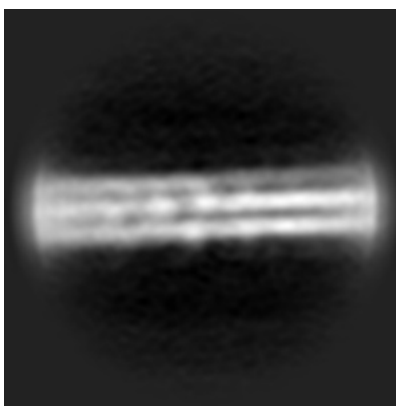
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

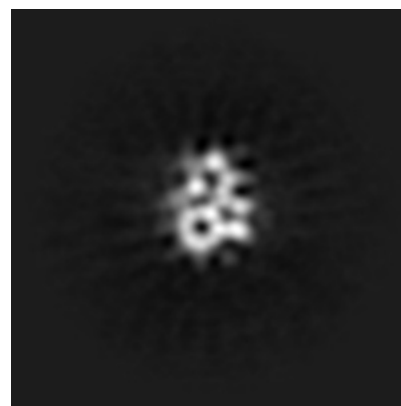
#### 6.1.1 Primary map



X

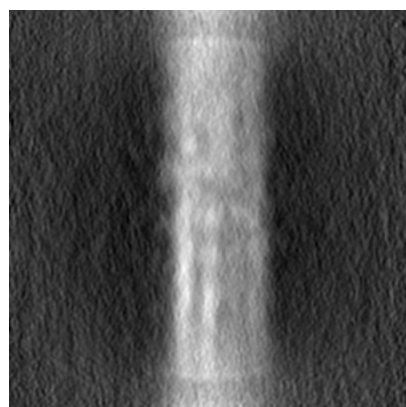


Y

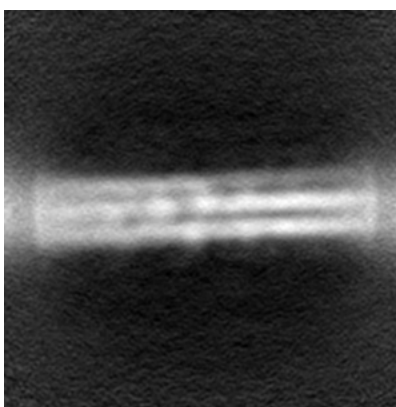


Z

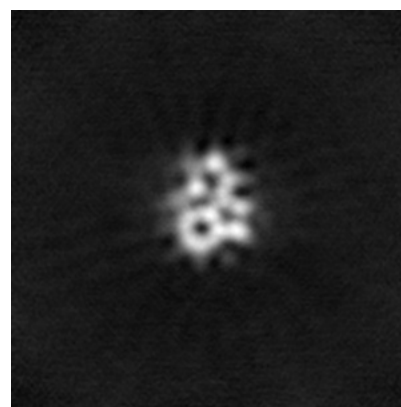
#### 6.1.2 Raw map



X



Y

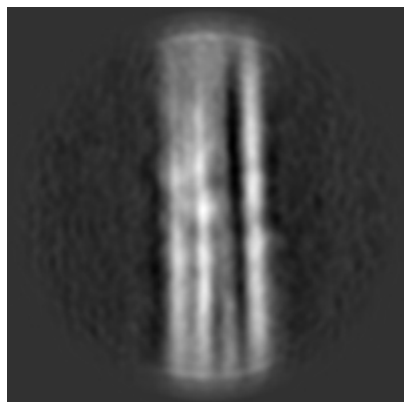


Z

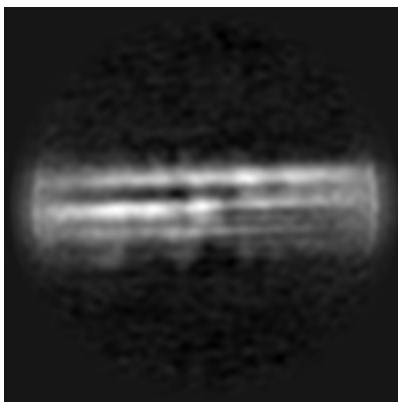
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

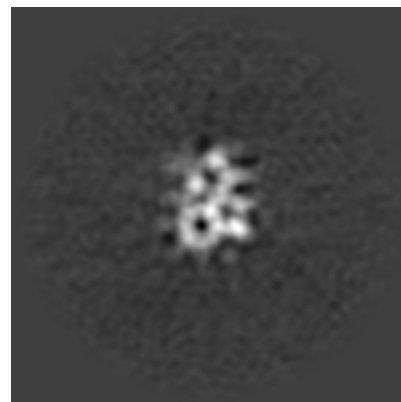
### 6.2.1 Primary map



X Index: 90

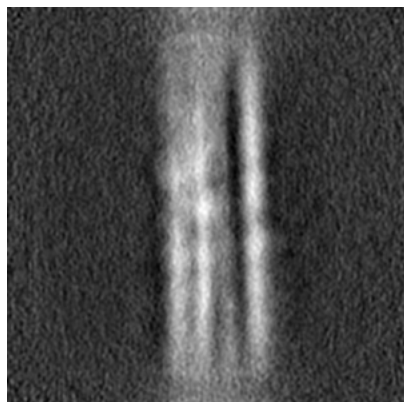


Y Index: 90

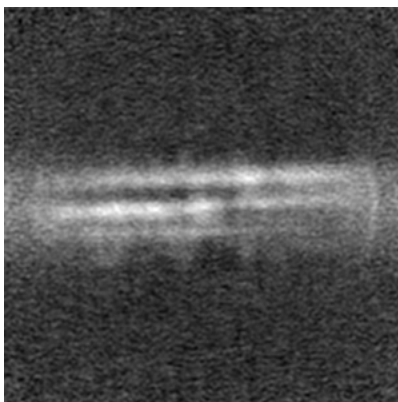


Z Index: 90

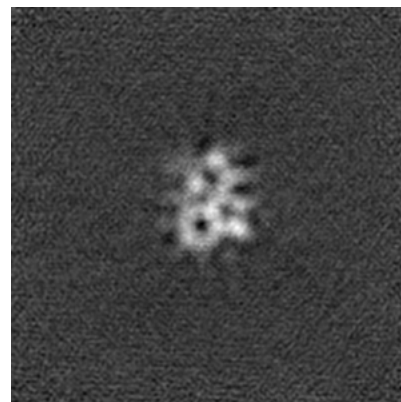
### 6.2.2 Raw map



X Index: 90



Y Index: 90



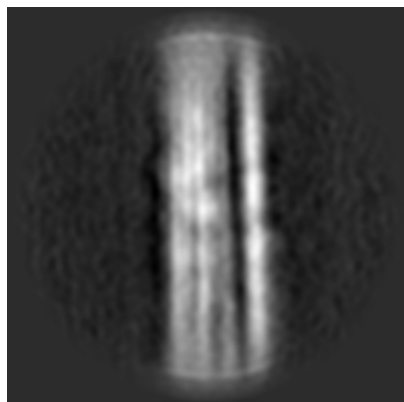
Z Index: 90

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

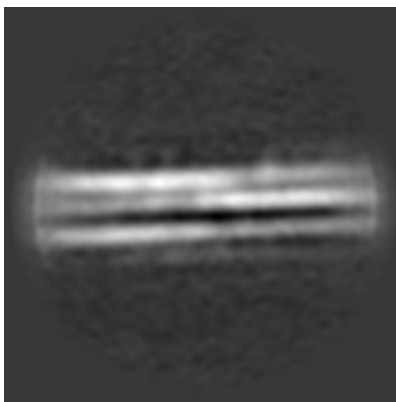


## 6.3 Largest variance slices [i](#)

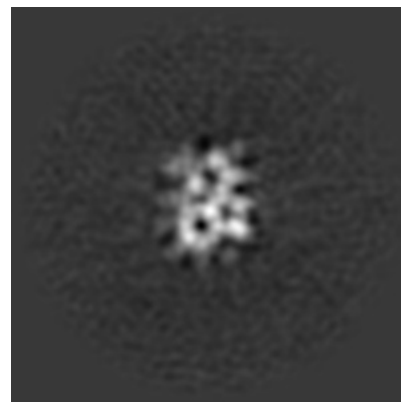
### 6.3.1 Primary map



X Index: 91

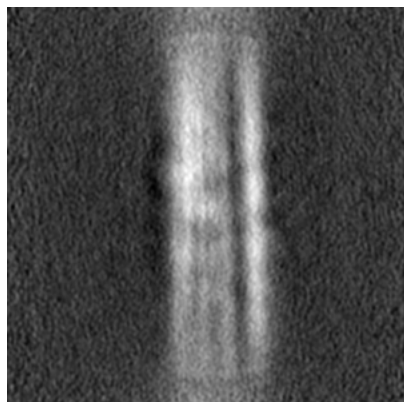


Y Index: 80

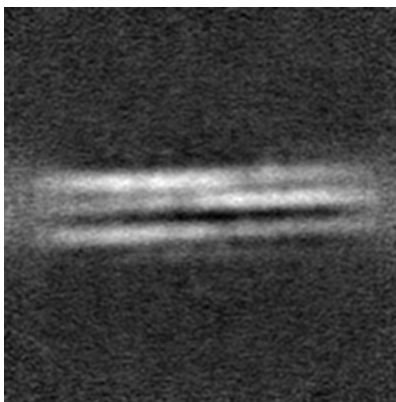


Z Index: 87

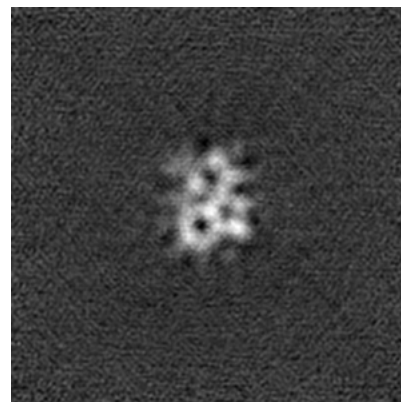
### 6.3.2 Raw map



X Index: 92



Y Index: 80

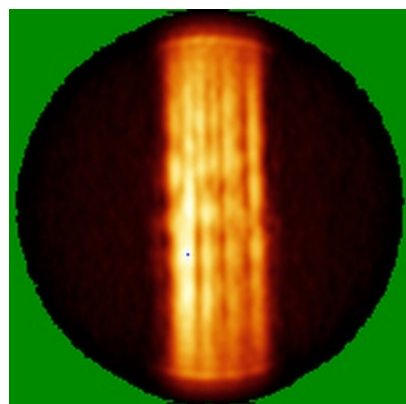


Z Index: 88

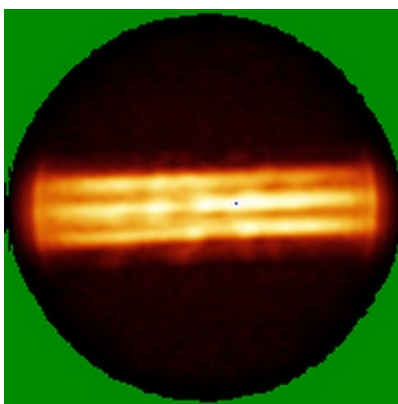
The images above show the largest variance slices of the map in three orthogonal directions.

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

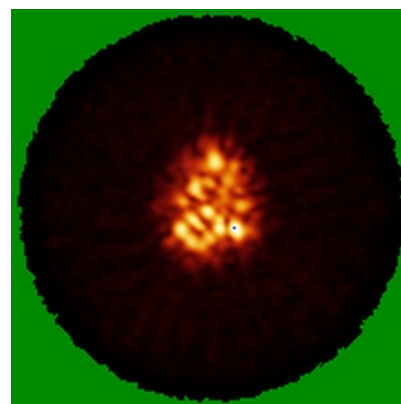
### 6.4.1 Primary map



X

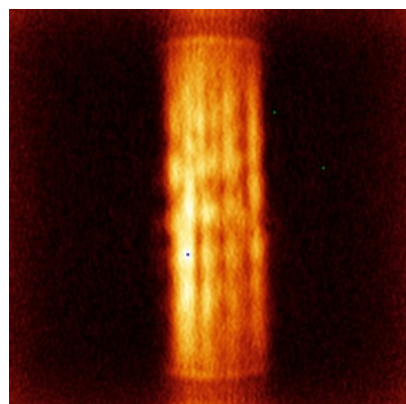


Y

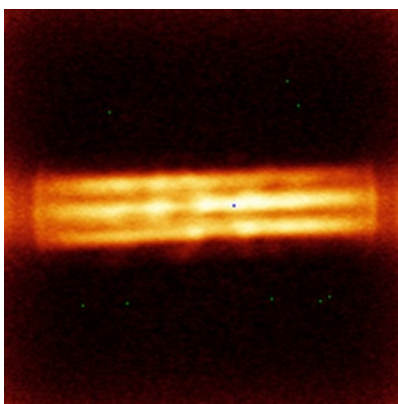


Z

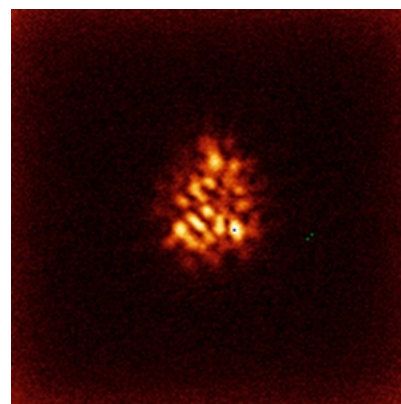
### 6.4.2 Raw map



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 0.97. 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.

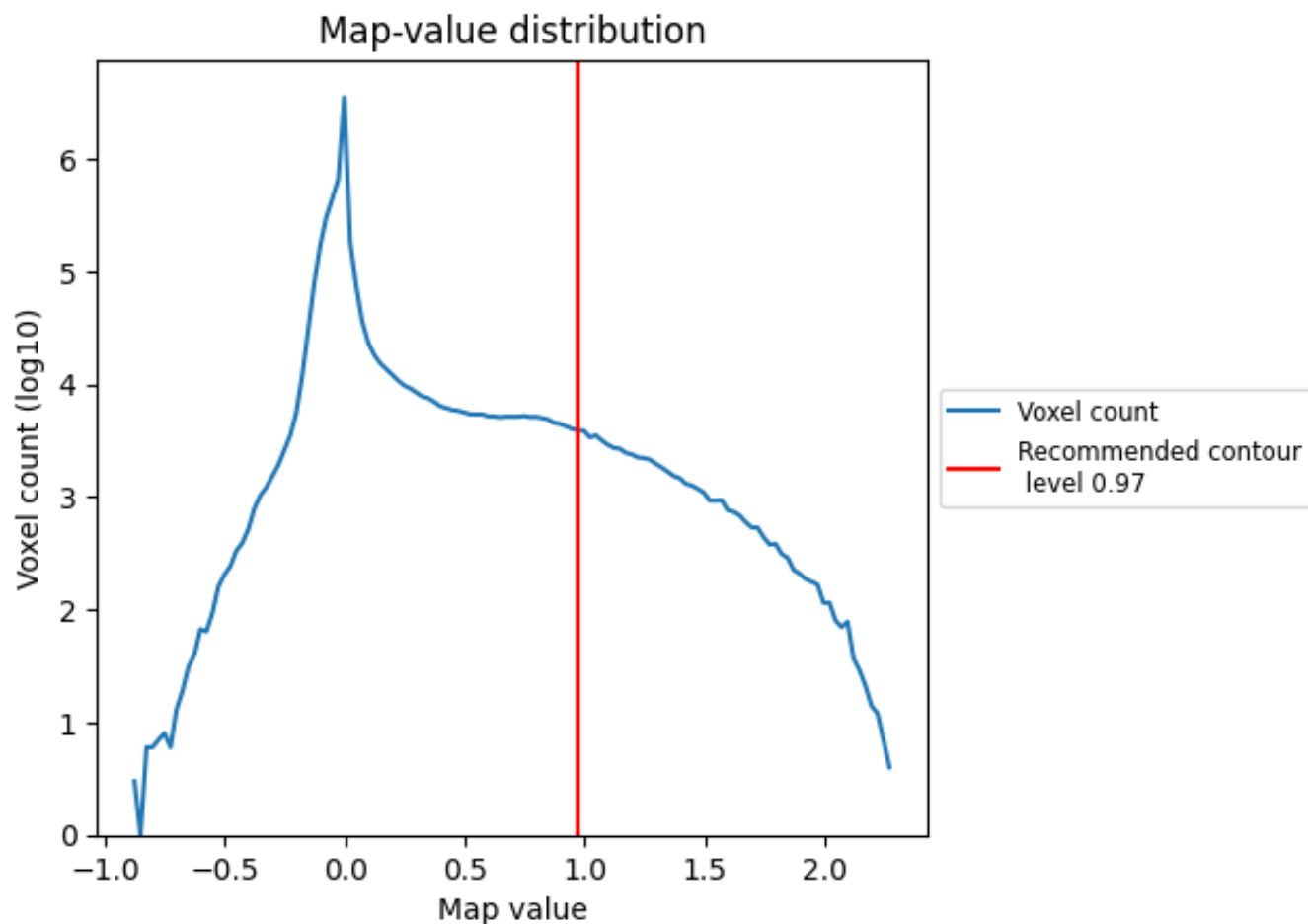
## 6.6 Mask visualisation [i](#)

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

## 7 Map analysis [i](#)

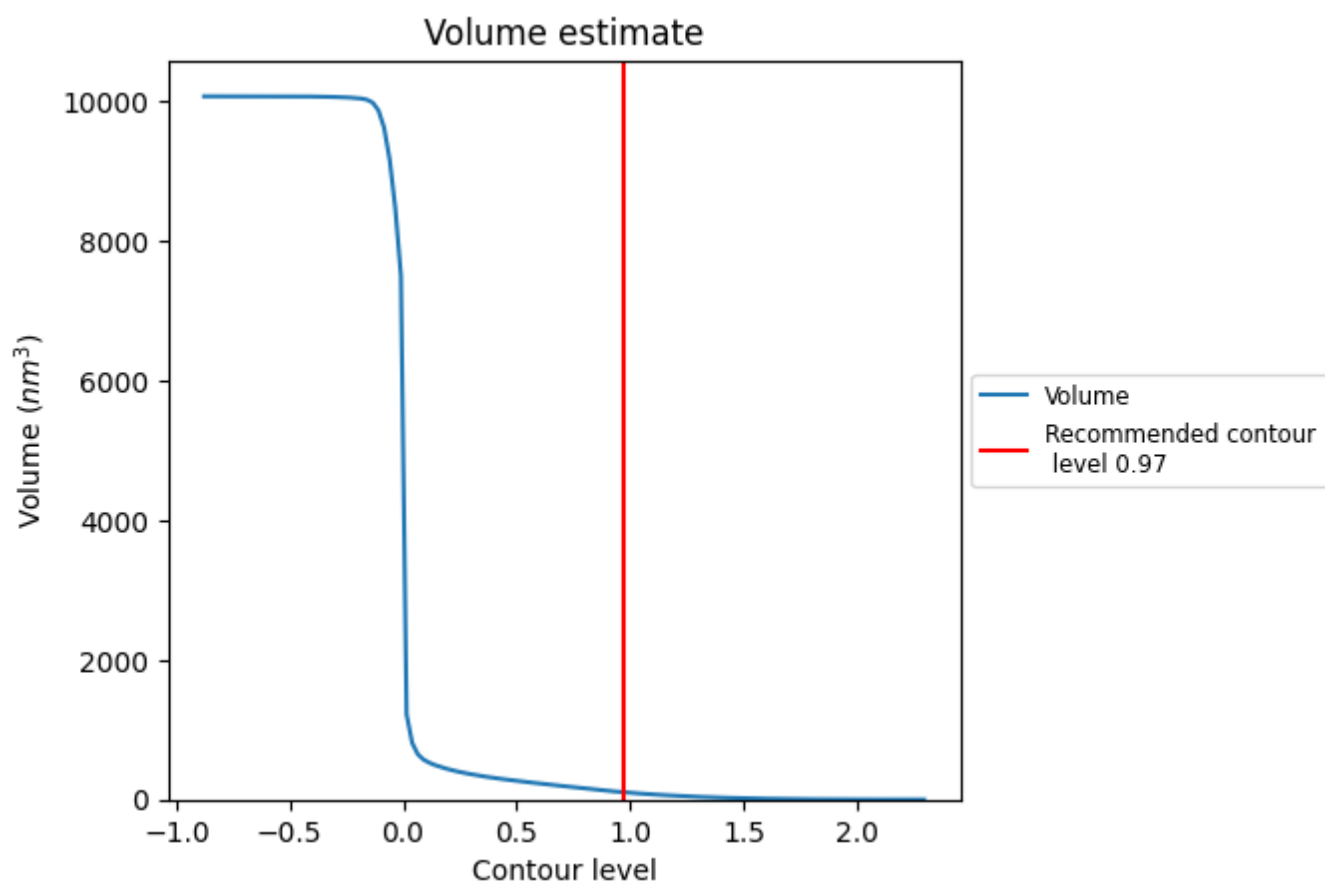
This section contains the results of statistical analysis of the map.

### 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.

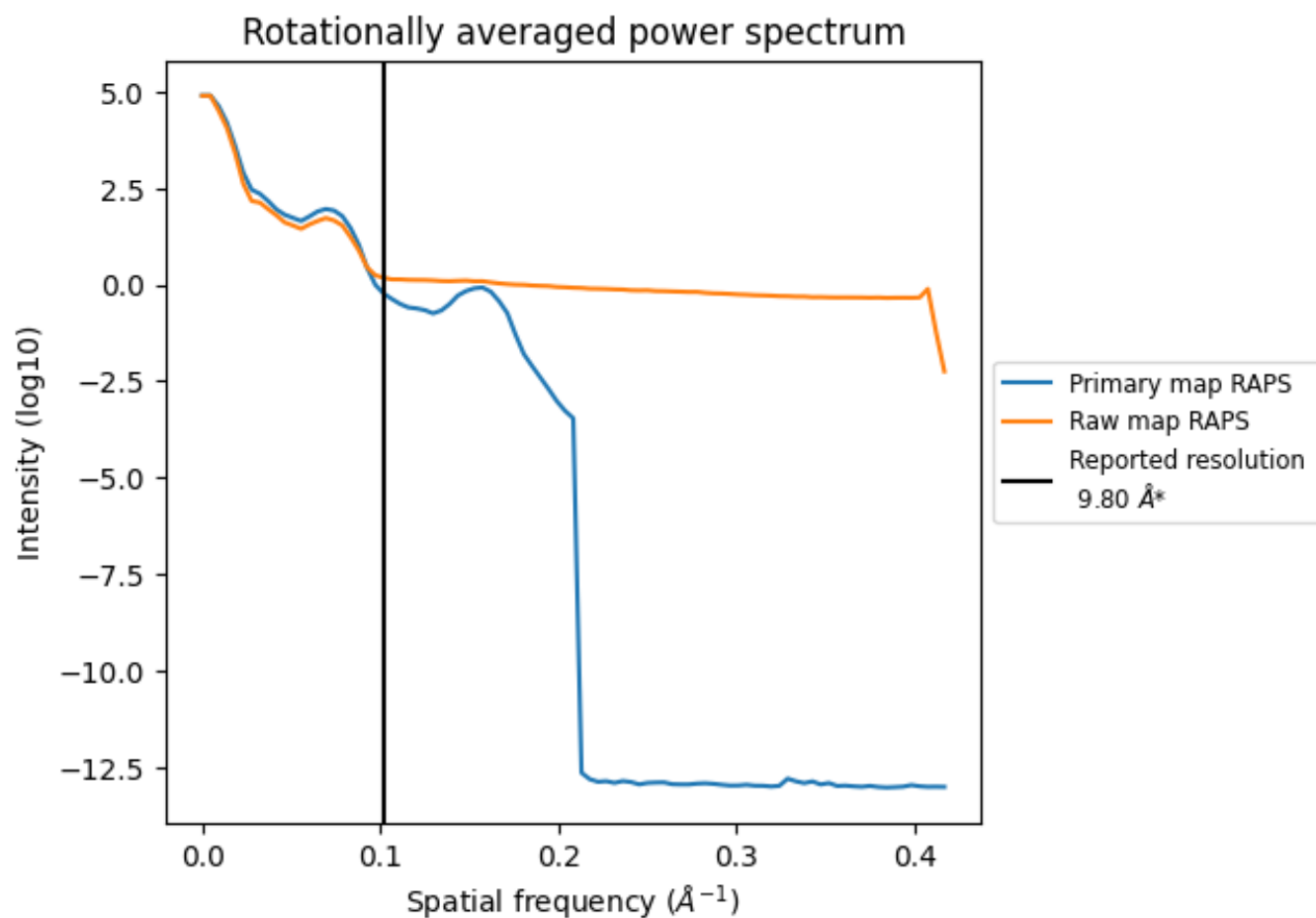
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 105 nm<sup>3</sup>; this corresponds to an approximate mass of 95 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 ⓘ

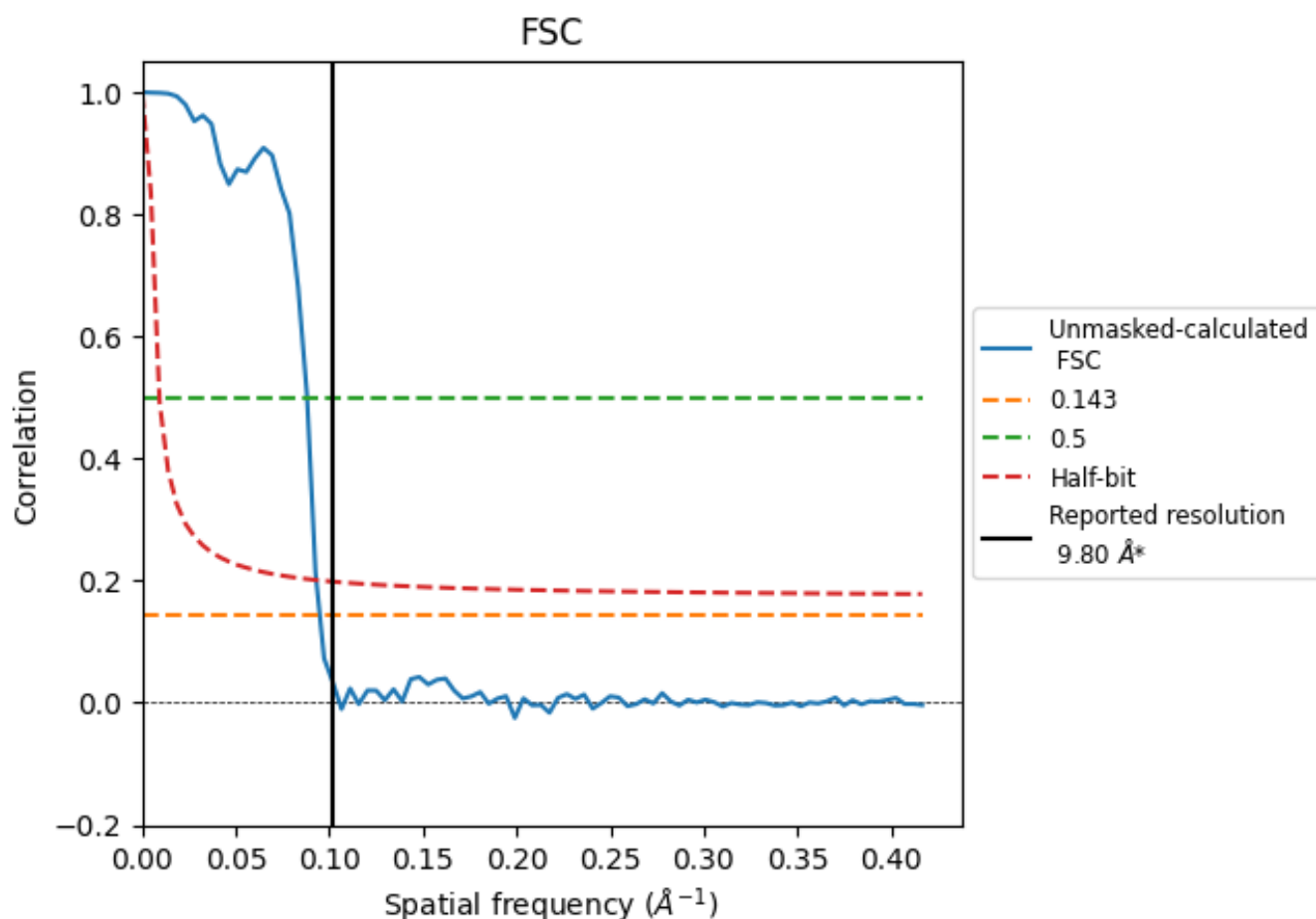


\*Reported resolution corresponds to spatial frequency of 0.102 Å<sup>-1</sup>

## 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 0.102 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	9.80	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	10.54	11.35	10.75

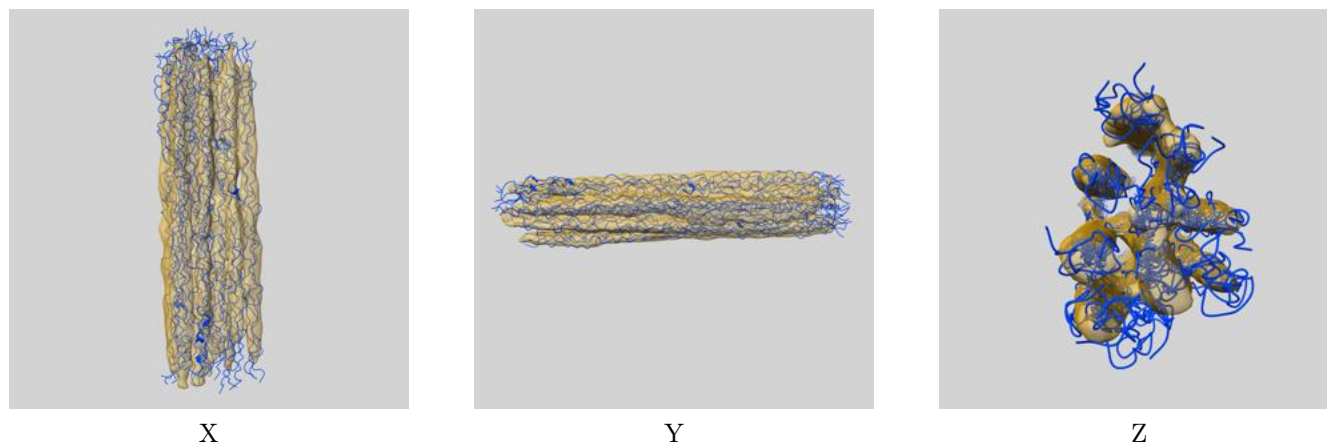
\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.



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

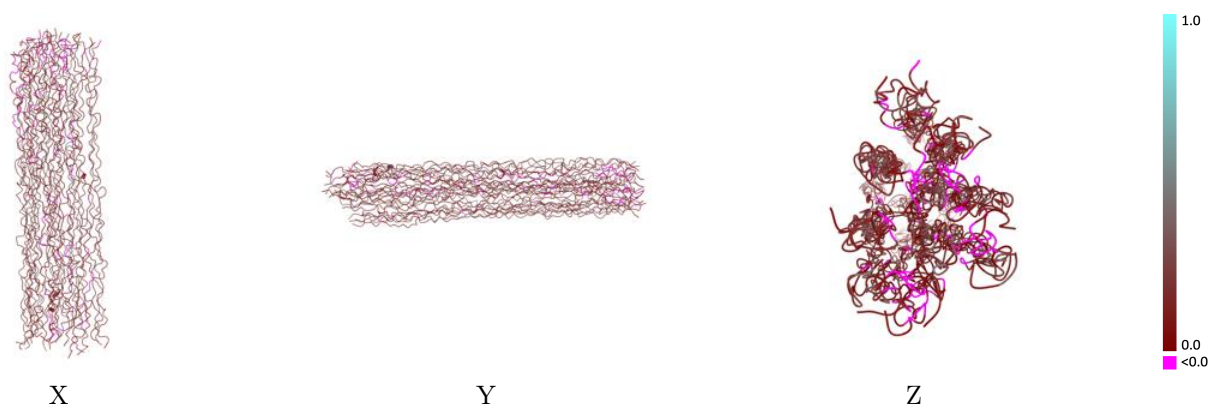
This section contains information regarding the fit between EMDB map EMD-60913 and PDB model 9IUS. Per-residue inclusion information can be found in section 3 on page 7.

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



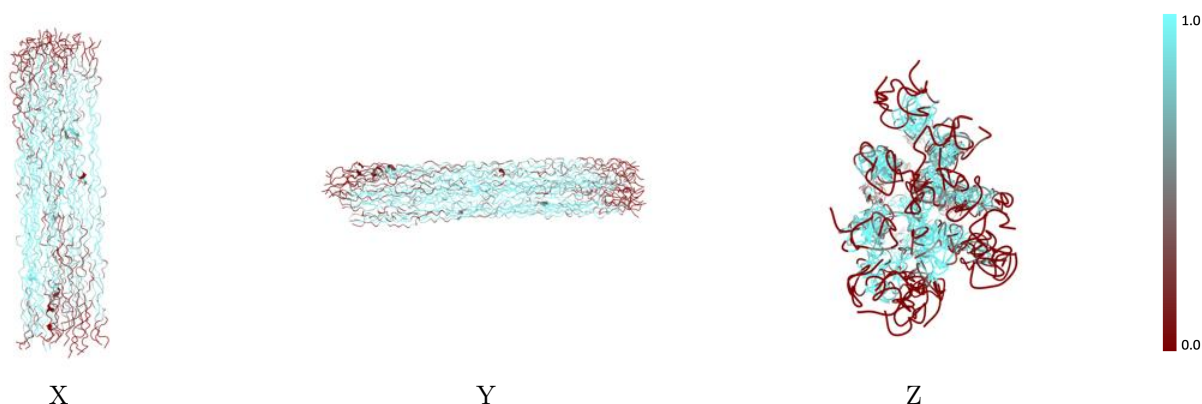
The images above show the 3D surface view of the map at the recommended contour level 0.97 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



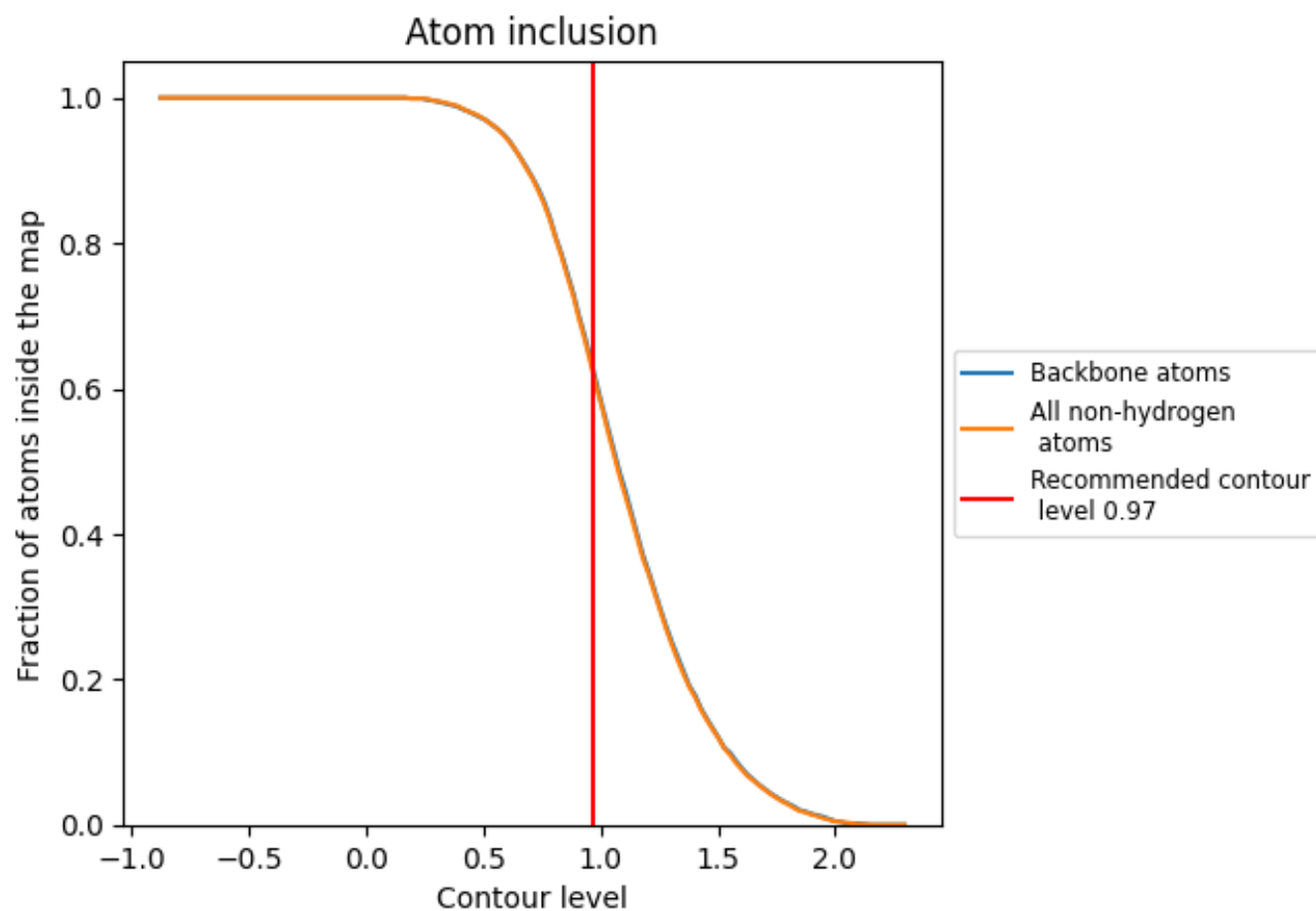
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.97).































































## 9.4 Atom inclusion [i](#)



At the recommended contour level, 62% of all backbone atoms, 62% 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 (0.97) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.6170	 0.1700
1	 0.8550	 0.2110
2	 0.6240	 0.1710
3	 0.6060	 0.1970
4	 0.6250	 0.1350
A	 0.4460	 0.1280
B	 0.4390	 0.1220
C	 0.5070	 0.1720
D	 0.5240	 0.1260
E	 0.4680	 0.1650
F	 0.6730	 0.2080
G	 0.6810	 0.2030
H	 0.6300	 0.1650
I	 0.4410	 0.1040
J	 0.4750	 0.1310
K	 0.5730	 0.1890
L	 0.7020	 0.2090
M	 0.6990	 0.2000
N	 0.6390	 0.1660
O	 0.5340	 0.1210
P	 0.6280	 0.1980
Q	 0.6660	 0.1970
R	 0.7430	 0.1720
S	 0.7620	 0.1710
T	 0.7130	 0.2040
U	 0.6470	 0.1800
V	 0.5880	 0.1380
W	 0.5140	 0.1430
X	 0.5290	 0.1920
Y	 0.8630	 0.1950
Z	 0.8490	 0.2030

