



Full wwPDB EM Validation Report ⓘ

Nov 17, 2025 – 07:51 PM JST

PDB ID : 8ZL8 / pdb_00008zl8
EMDB ID : EMD-60222
Title : Structure of Polycystin-1/Polycystin-2 complex with 7b,27-DHC
Authors : Chen, M.Y.; Su, Q.; Shi, Y.G.
Deposited on : 2024-05-17
Resolution : 3.38 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.dev129
Mogul : 1.8.5 (274361), CSD as541be (2020)
MolProbity : 4-5-2 with Phenix2.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
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) : 2.46

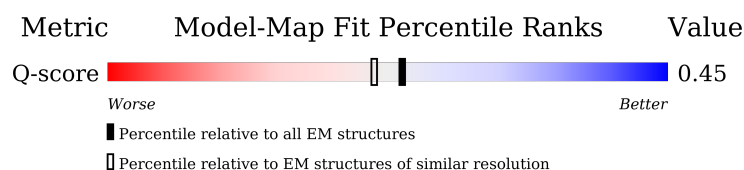
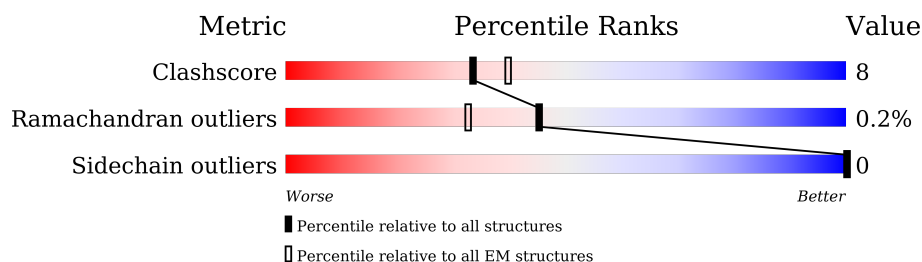
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.38 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	210492	15764	-
Ramachandran outliers	207382	16835	-
Sidechain outliers	206894	16415	-
Q-score	-	25397	14261 (2.88 - 3.88)

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	1261	
2	B	1007	
2	C	1007	
2	D	1007	

2 Entry composition

There are 4 unique types of molecules in this entry. The entry contains 16728 atoms, of which 46 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 Polycystin-1.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	A	759	5636	3636	1029	953	18	0	0

There are 9 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	3043	MET	-	initiating methionine	UNP P98161
A	3044	ASP	-	expression tag	UNP P98161
A	3045	TYR	-	expression tag	UNP P98161
A	3046	LYS	-	expression tag	UNP P98161
A	3047	ASP	-	expression tag	UNP P98161
A	3048	ASP	-	expression tag	UNP P98161
A	3049	ASP	-	expression tag	UNP P98161
A	3050	ASP	-	expression tag	UNP P98161
A	3051	LYS	-	expression tag	UNP P98161

- Molecule 2 is a protein called Polycystin-2.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	B	476	3938	2601	622	694	21	0	0
2	C	467	3858	2549	608	682	19	0	0
2	D	474	3136	2030	528	565	13	0	0

There are 117 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	-38	MET	-	initiating methionine	UNP Q13563
B	-37	GLY	-	expression tag	UNP Q13563
B	-36	ALA	-	expression tag	UNP Q13563
B	-35	SER	-	expression tag	UNP Q13563

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Chain	Residue	Modelled	Actual	Comment	Reference
B	-34	SER	-	expression tag	UNP Q13563
B	-33	ALA	-	expression tag	UNP Q13563
B	-32	TRP	-	expression tag	UNP Q13563
B	-31	SER	-	expression tag	UNP Q13563
B	-30	HIS	-	expression tag	UNP Q13563
B	-29	PRO	-	expression tag	UNP Q13563
B	-28	GLN	-	expression tag	UNP Q13563
B	-27	PHE	-	expression tag	UNP Q13563
B	-26	GLU	-	expression tag	UNP Q13563
B	-25	LYS	-	expression tag	UNP Q13563
B	-24	GLY	-	expression tag	UNP Q13563
B	-23	GLY	-	expression tag	UNP Q13563
B	-22	GLY	-	expression tag	UNP Q13563
B	-21	SER	-	expression tag	UNP Q13563
B	-20	GLY	-	expression tag	UNP Q13563
B	-19	GLY	-	expression tag	UNP Q13563
B	-18	GLY	-	expression tag	UNP Q13563
B	-17	SER	-	expression tag	UNP Q13563
B	-16	GLY	-	expression tag	UNP Q13563
B	-15	GLY	-	expression tag	UNP Q13563
B	-14	SER	-	expression tag	UNP Q13563
B	-13	ALA	-	expression tag	UNP Q13563
B	-12	TRP	-	expression tag	UNP Q13563
B	-11	SER	-	expression tag	UNP Q13563
B	-10	HIS	-	expression tag	UNP Q13563
B	-9	PRO	-	expression tag	UNP Q13563
B	-8	GLN	-	expression tag	UNP Q13563
B	-7	PHE	-	expression tag	UNP Q13563
B	-6	GLU	-	expression tag	UNP Q13563
B	-5	LYS	-	expression tag	UNP Q13563
B	-4	GLY	-	expression tag	UNP Q13563
B	-3	SER	-	linker	UNP Q13563
B	-2	ALA	-	linker	UNP Q13563
B	-1	ALA	-	linker	UNP Q13563
B	0	ALA	-	linker	UNP Q13563
C	-38	MET	-	initiating methionine	UNP Q13563
C	-37	GLY	-	expression tag	UNP Q13563
C	-36	ALA	-	expression tag	UNP Q13563
C	-35	SER	-	expression tag	UNP Q13563
C	-34	SER	-	expression tag	UNP Q13563
C	-33	ALA	-	expression tag	UNP Q13563
C	-32	TRP	-	expression tag	UNP Q13563

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-31	SER	-	expression tag	UNP Q13563
C	-30	HIS	-	expression tag	UNP Q13563
C	-29	PRO	-	expression tag	UNP Q13563
C	-28	GLN	-	expression tag	UNP Q13563
C	-27	PHE	-	expression tag	UNP Q13563
C	-26	GLU	-	expression tag	UNP Q13563
C	-25	LYS	-	expression tag	UNP Q13563
C	-24	GLY	-	expression tag	UNP Q13563
C	-23	GLY	-	expression tag	UNP Q13563
C	-22	GLY	-	expression tag	UNP Q13563
C	-21	SER	-	expression tag	UNP Q13563
C	-20	GLY	-	expression tag	UNP Q13563
C	-19	GLY	-	expression tag	UNP Q13563
C	-18	GLY	-	expression tag	UNP Q13563
C	-17	SER	-	expression tag	UNP Q13563
C	-16	GLY	-	expression tag	UNP Q13563
C	-15	GLY	-	expression tag	UNP Q13563
C	-14	SER	-	expression tag	UNP Q13563
C	-13	ALA	-	expression tag	UNP Q13563
C	-12	TRP	-	expression tag	UNP Q13563
C	-11	SER	-	expression tag	UNP Q13563
C	-10	HIS	-	expression tag	UNP Q13563
C	-9	PRO	-	expression tag	UNP Q13563
C	-8	GLN	-	expression tag	UNP Q13563
C	-7	PHE	-	expression tag	UNP Q13563
C	-6	GLU	-	expression tag	UNP Q13563
C	-5	LYS	-	expression tag	UNP Q13563
C	-4	GLY	-	expression tag	UNP Q13563
C	-3	SER	-	linker	UNP Q13563
C	-2	ALA	-	linker	UNP Q13563
C	-1	ALA	-	linker	UNP Q13563
C	0	ALA	-	linker	UNP Q13563
D	-38	MET	-	initiating methionine	UNP Q13563
D	-37	GLY	-	expression tag	UNP Q13563
D	-36	ALA	-	expression tag	UNP Q13563
D	-35	SER	-	expression tag	UNP Q13563
D	-34	SER	-	expression tag	UNP Q13563
D	-33	ALA	-	expression tag	UNP Q13563
D	-32	TRP	-	expression tag	UNP Q13563
D	-31	SER	-	expression tag	UNP Q13563
D	-30	HIS	-	expression tag	UNP Q13563
D	-29	PRO	-	expression tag	UNP Q13563

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Chain	Residue	Modelled	Actual	Comment	Reference
D	-28	GLN	-	expression tag	UNP Q13563
D	-27	PHE	-	expression tag	UNP Q13563
D	-26	GLU	-	expression tag	UNP Q13563
D	-25	LYS	-	expression tag	UNP Q13563
D	-24	GLY	-	expression tag	UNP Q13563
D	-23	GLY	-	expression tag	UNP Q13563
D	-22	GLY	-	expression tag	UNP Q13563
D	-21	SER	-	expression tag	UNP Q13563
D	-20	GLY	-	expression tag	UNP Q13563
D	-19	GLY	-	expression tag	UNP Q13563
D	-18	GLY	-	expression tag	UNP Q13563
D	-17	SER	-	expression tag	UNP Q13563
D	-16	GLY	-	expression tag	UNP Q13563
D	-15	GLY	-	expression tag	UNP Q13563
D	-14	SER	-	expression tag	UNP Q13563
D	-13	ALA	-	expression tag	UNP Q13563
D	-12	TRP	-	expression tag	UNP Q13563
D	-11	SER	-	expression tag	UNP Q13563
D	-10	HIS	-	expression tag	UNP Q13563
D	-9	PRO	-	expression tag	UNP Q13563
D	-8	GLN	-	expression tag	UNP Q13563
D	-7	PHE	-	expression tag	UNP Q13563
D	-6	GLU	-	expression tag	UNP Q13563
D	-5	LYS	-	expression tag	UNP Q13563
D	-4	GLY	-	expression tag	UNP Q13563
D	-3	SER	-	linker	UNP Q13563
D	-2	ALA	-	linker	UNP Q13563
D	-1	ALA	-	linker	UNP Q13563
D	0	ALA	-	linker	UNP Q13563

- Molecule 3 is (3 {S},7 {R},8 {S},9 {S},10 {R},13 {R},14 {S},17 {R})-10,13-dimethyl-17-[(2 {R},6 {R})-6-methyl-7-oxidanyl-heptan-2-yl]-2,3,4,7,8,9,11,12,14,15,16,17-dodecahydro-1 {H}-cyclopenta[a]phenanthrene-3,7-diol (CCD ID: A1EQ3) (formula: C₂₇H₄₆O₃).



- Molecule 4 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $\text{C}_8\text{H}_{15}\text{NO}_6$).



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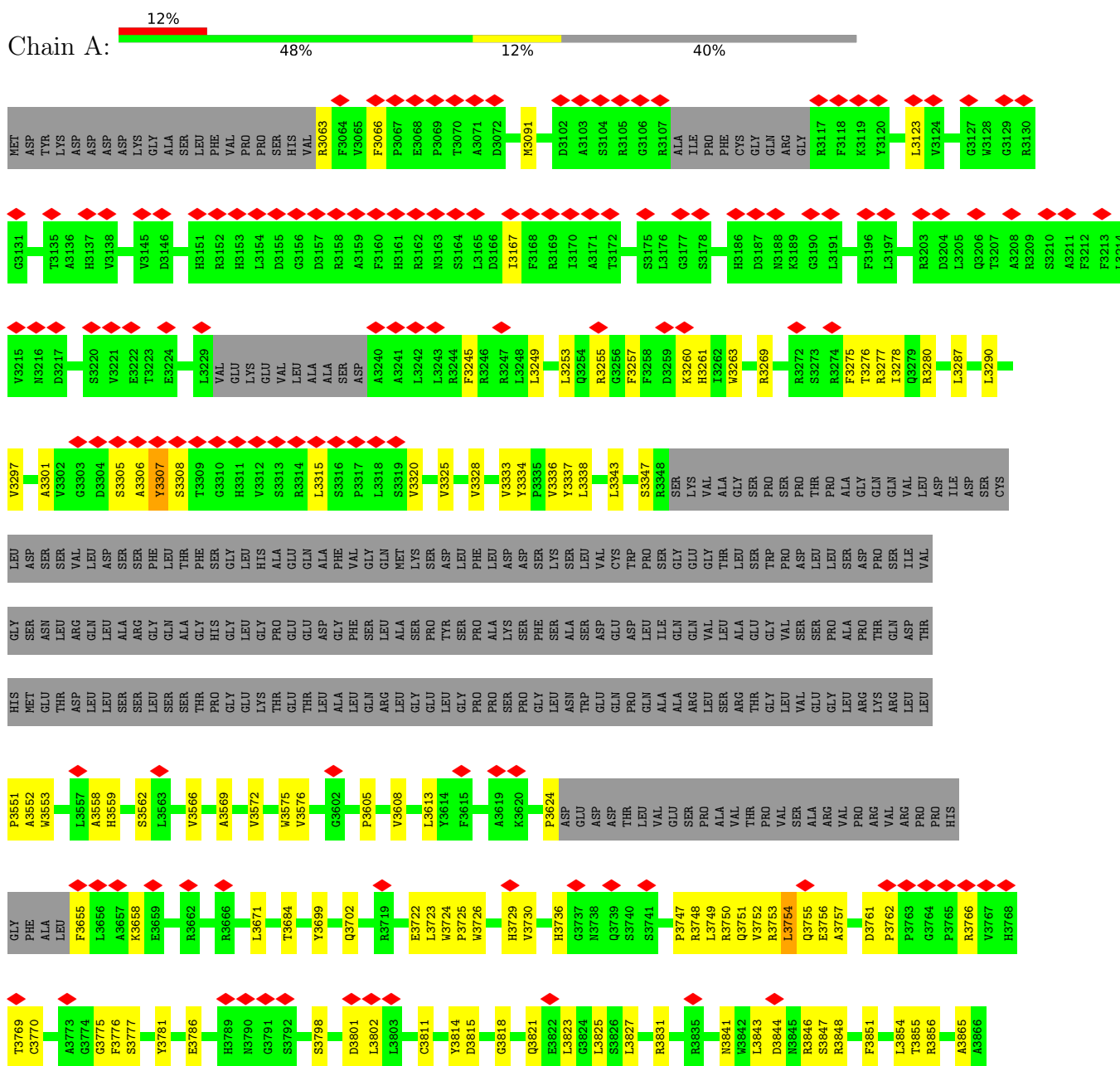
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Mol	Chain	Residues	Atoms				AltConf
4	B	1	Total	C	N	O	0
			14	8	1	5	
4	C	1	Total	C	N	O	0
			14	8	1	5	
4	C	1	Total	C	N	O	0
			14	8	1	5	
4	C	1	Total	C	N	O	0
			14	8	1	5	

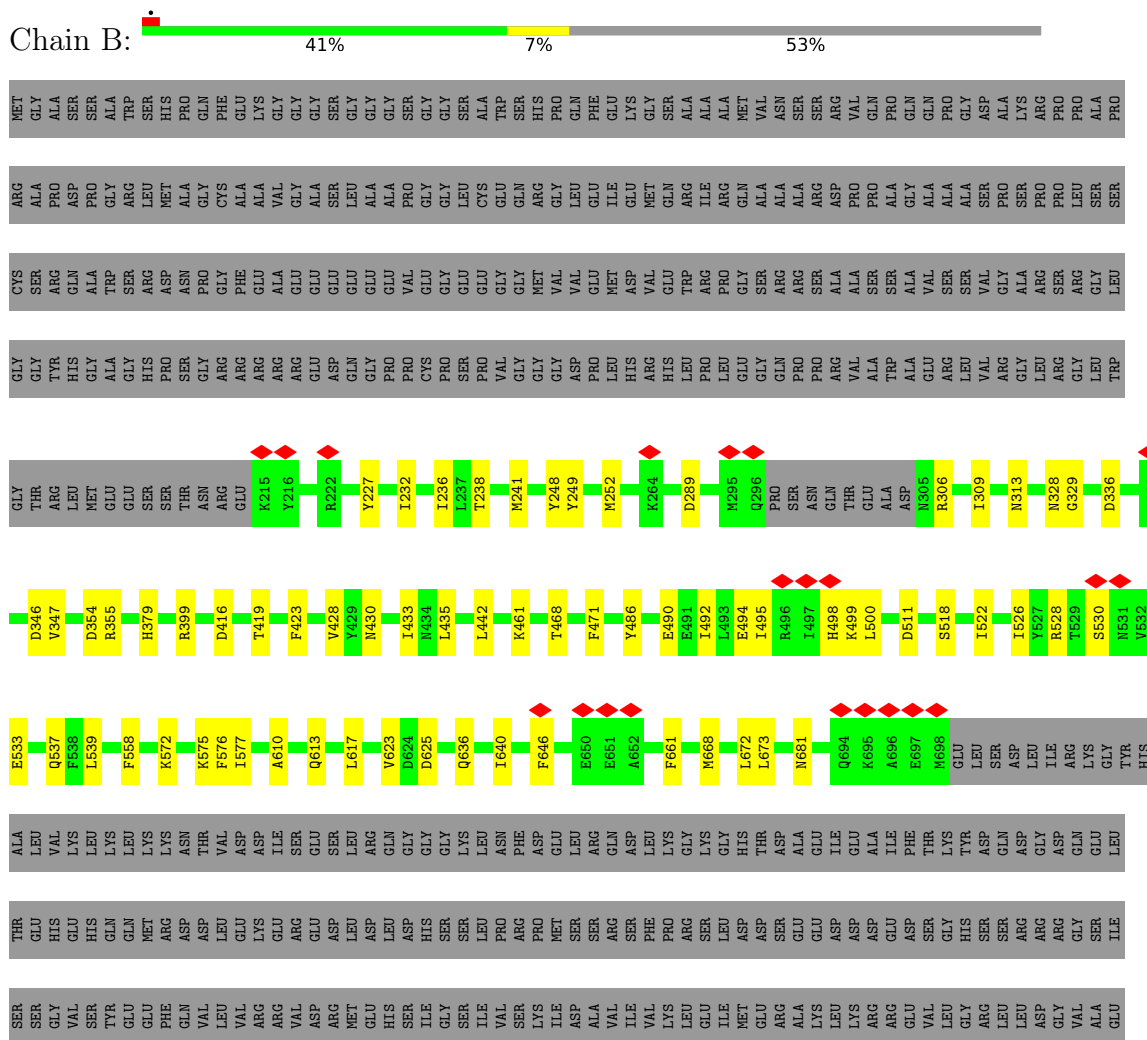
3 Residue-property plots

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: Polycystin-1

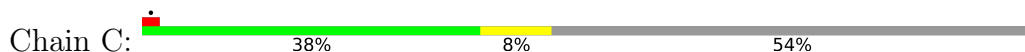


- Molecule 2: Polycystin-2



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- Molecule 2: Polycystin-2



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

GLY THR ARG ARG MET MET GLU GLU SER SER SER ASN ARG GLU L224 L225 L226 L227 L228 L229 L234 L235 L236 L237 L238 L239 L240 L241 L242 L243 L244 L245 L246 L247 L248 L249 L250 L251 L252 L253 L254 L255 L256 L257 L258 L259 L260 L261 L262 L263 L264 L265 L266 L267 L268 L269 L270 L271 L272 L273 L274 L275 L276 L277 L278 L279 L280 L281 L282 L283 L284 L285 L286 L287 L288 L289 L290 L291 L292 L293 L294 L295 L296 L297 L298 L299 L300 L301 L302 L303 L304 L305 L306 L307 L308 L309 L310 L311 L312 L313 L314 L315 L316 L317 L318 L319 L320 L321 L322 L323 L324 L325 L326 L327 L328 L329 L330 L331 L332 L333 L334 L335 L336 L337 L338 L339 L340 L341 L342 L343 L344 L345 L346 L347 L348 L349 L350 L351 L352 L353 L354 L355 L356 L357 L358 L359 L360 L361 L362 L363 L364 L365 L366 L367 L368 L369 L370 L371 L372 L373 L374 L375 L376 L377 L378 L379 L380 L381 L382 L383 L384 L385 L386 L387 L388 L389 L390 L391 L392 L393 L394 L395 L396 L397 L398 L399 L400 L401 L402 L403 L404 L405 L406 L407 L408 L409 L410 L411 L412 L413 L414 L415 L416 L417 L418 L419 L420 L421 L422 L423 L424 L425 L426 L427 L428 L429 L430 L431 L432 L433 L434 L435 L436 L437 L438 L439 L440 L441 L442 L443 L444 L445 L446 L447 L448 L449 L450 L451 L452 L453 L454 L455 L456 L457 L458 L459 L460 L461 L462 L463 L464 L465 L466 L467 L468 L469 L470 L471 L472 L473 L474 L475 L476 L477 L478 L479 L480 L481 L482 L483 L484 L485 L486 L487 L488 L489 L490 L491 L492 L493 L494 L495 L496 L497 L498 L499 L500 L501 L502 L503 L504 L505 L506 L507 L508 L509 L510 L511 L512 L513 L514 L515 L516 L517 L518 L519 L520 L521 L522 L523 L524 L525 L526 L527 L528 L529 L530 L531 L532 L533 L534 L535 L536 L537 L538 L539 L540 L541 L542 L543 L544 L545 L546 L547 L548 L549 L550 L551 L552 L553 L554 L555 L556 L557 L558 L559 L560 L561 L562 L563 L564 L565 L566 L567 L568 L569 L570 L571 L572 L573 L574 L575 L576 L577 L578 L579 L580 L581 L582 L583 L584 L585 L586 L587 L588 L589 L590 L591 L592 L593 L594 L595 L596 L597 L598 L599 L600 L601 L602 L603 L604 L605 L606 L607 L608 L609 L610 L611 L612 L613 L614 L615 L616 L617 L618 L619 L620 L621 L622 L623 L624 L625 L626 L627 L628 L629 L630 L631 L632 L633 L634 L635 L636 L637 L638 L639 L640 L641 L642 L643 L644 L645 L646 L647 L648 L649 L650 L651 L652 L653 L654 L655 L656 L657 L658 L659 L660 L661 L662 L663 L664 L665 L666 L667 L668 L669 L670 L671 L672 L673 L674 L675 L676 L677 L678 L679 L680 L681 L682 L683 L684 L685 L686 L687 L688 L689 L690 L691 L692 L693 L694 L695 L696 L697 L698 L699 L700 L701 L702 L703 L704 L705 L706 L707 L708 L709 L710 L711 L712 L713 L714 L715 L716 L717 L718 L719 L720 L721 L722 L723 L724 L725 L726 L727 L728 L729 L730 L731 L732 L733 L734 L735 L736 L737 L738 L739 L740 L741 L742 L743 L744 L745 L746 L747 L748 L749 L750 L751 L752 L753 L754 L755 L756 L757 L758 L759 L760 L761 L762 L763 L764 L765 L766 L767 L768 L769 L770 L771 L772 L773 L774 L775 L776 L777 L778 L779 L780 L781 L782 L783 L784 L785 L786 L787 L788 L789 L790 L791 L792 L793 L794 L795 L796 L797 L798 L799 L800 L801 L802 L803 L804 L805 L806 L807 L808 L809 L810 L811 L812 L813 L814 L815 L816 L817 L818 L819 L820 L821 L822 L823 L824 L825 L826 L827 L828 L829 L830 L831 L832 L833 L834 L835 L836 L837 L838 L839 L840 L841 L842 L843 L844 L845 L846 L847 L848 L849 L850 L851 L852 L853 L854 L855 L856 L857 L858 L859 L860 L861 L862 L863 L864 L865 L866 L867 L868 L869 L870 L871 L872 L873 L874 L875 L876 L877 L878 L879 L880 L881 L882 L883 L884 L885 L886 L887 L888 L889 L890 L891 L892 L893 L894 L895 L896 L897 L898 L899 L900 L901 L902 L903 L904 L905 L906 L907 L908 L909 L910 L911 L912 L913 L914 L915 L916 L917 L918 L919 L920 L921 L922 L923 L924 L925 L926 L927 L928 L929 L930 L931 L932 L933 L934 L935 L936 L937 L938 L939 L940 L941 L942 L943 L944 L945 L946 L947 L948 L949 L950 L951 L952 L953 L954 L955 L956 L957 L958 L959 L960 L961 L962 L963 L964 L965 L966 L967 L968 L969 L970 L971 L972 L973 L974 L975 L976 L977 L978 L979 L980 L981 L982 L983 L984 L985 L986 L987 L988 L989 L990 L991 L992 L993 L994 L995 L996 L997 L998 L999 L1000 L1001 L1002 L1003 L1004 L1005 L1006 L1007 L1008 L1009 L1010 L1011 L1012 L1013 L1014 L1015 L1016 L1017 L1018 L1019 L1020 L1021 L1022 L1023 L1024 L1025 L1026 L1027 L1028 L1029 L1030 L1031 L1032 L1033 L1034 L1035 L1036 L1037 L1038 L1039 L1040 L1041 L1042 L1043 L1044 L1045 L1046 L1047 L1048 L1049 L1050 L1051 L1052 L1053 L1054 L1055 L1056 L1057 L1058 L1059 L1060 L1061 L1062 L1063 L1064 L1065 L1066 L1067 L1068 L1069 L1070 L1071 L1072 L1073 L1074 L1075 L1076 L1077 L1078 L1079 L1080 L1081 L1082 L1083 L1084 L1085 L1086 L1087 L1088 L1089 L1090 L1091 L1092 L1093 L1094 L1095 L1096 L1097 L1098 L1099 L1100 L1101 L1102 L1103 L1104 L1105 L1106 L1107 L1108 L1109 L1110 L1111 L1112 L1113 L1114 L1115 L1116 L1117 L1118 L1119 L1120 L1121 L1122 L1123 L1124 L1125 L1126 L1127 L1128 L1129 L1130 L1131 L1132 L1133 L1134 L1135 L1136 L1137 L1138 L1139 L1140 L1141 L1142 L1143 L1144 L1145 L1146 L1147 L1148 L1149 L1150 L1151 L1152 L1153 L1154 L1155 L1156 L1157 L1158 L1159 L1160 L1161 L1162 L1163 L1164 L1165 L1166 L1167 L1168 L1169 L1170 L1171 L1172 L1173 L1174 L1175 L1176 L1177 L1178 L1179 L1180 L1181 L1182 L1183 L1184 L1185 L1186 L1187 L1188 L1189 L1190 L1191 L1192 L1193 L1194 L1195 L1196 L

E491	E496	L497	L492	L493	L500	H501	L510	F514	V519	I522	V532	E533	L536	Q537	E540	D541	Q542	N547	A562	T565	V569	F579	Q585	B592	C593	L597	F600	F608	V623	D624	I633	F670	M675	T679	E680					
Q323	L324	N328	G329	D336	L337	R338	D339	E340	Y345	D346	V347	E371	L374	G376	S396	R397	T398	E401	T402	L415	T419	R420	A421	T422	F423	V428	Y429	M430	L442	T448	R464	Y465	V466	F469	D470	L473	C476	I479	Y489	E490

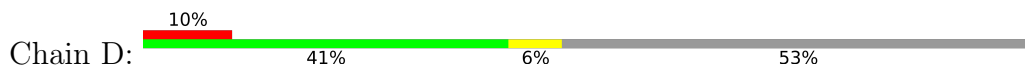
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ARG SER LEU LEU ASP ASP SER GLU GLU GLU ASP SER GLY HIS SER SER ARG ARG ARG GLY GLY VAL VAL TYR GLU GLU PHE GLY GLN VAL VAL LEU VAL VAL ARG ARG ARG VAL VAL ASP ARG ARG MET GLU HIS SER SER ILE ILE GLY SER ILE VAL VAL LYS ILE ILE ASP ALA VAL VAL ILE VAL VAL XS

LEU	ILE	GLU	MET	ARG	ALA	LYS	LEU	LYS	ARG	GLY	VAL	ASP	GLY	VAL	ALA	GLU	ASP	GLU	ARG	ASP	SER	ILE	GLU	HIS	ARG	GLY	GLN	TRP	ARG	GLU	SER	ASP	ALA	ALA	SER	GLN	ILE	SER
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HIS	GLY	LEU	GLY	THR	PRO	VAL	GLY	LEU	ASN	GLY	GLN	PRO	ARG	ARG	ARG	SER	SER	SER	ARG	PRO	SER	SER	SER	GLN	THR	GLU	GLY	MET	GLU	GLY	ALA	GLY	GLY	ASN	GLY	SER	SER	ASN	VAL	HIS	VAL
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- Molecule 2: Polycystin-2



MET	GLY	ALA	SER	ALA	TRP	SER	HIS	PRO	GLN	PHE	GLU	LYS	GLY	GLY	GLY	SER	GLY	GLY	GLY	SER	ALA	TRP	SER	HIS	PRO	GLN	PHE	GLU	LYS	GLY	GLY	SER	VAL	ASN	SER	SER	ARG	VAL	GLN	PRO	GLN	PRO	PRO	GLY	ASP	ALA	LYS	ARG	PRO	PRO	ALA	PRO
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4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	118205	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	NONE	Depositor
Microscope	FEI TECNAI F30	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	50	Depositor
Minimum defocus (nm)	1200	Depositor
Maximum defocus (nm)	2000	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	0.086	Depositor
Minimum map value	-0.043	Depositor
Average map value	0.001	Depositor
Map value standard deviation	0.003	Depositor
Recommended contour level	0.018	Depositor
Map size ($\text{\AA}$)	260.88, 260.88, 260.88	wwPDB
Map dimensions	240, 240, 240	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing ($\text{\AA}$)	1.087, 1.087, 1.087	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: A1EQ3, NAG

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	0.15	0/5771	0.42	1/7869 (0.0%)
2	B	0.14	0/4042	0.37	0/5481
2	C	0.16	0/3960	0.48	5/5373 (0.1%)
2	D	0.15	0/3188	0.46	1/4365 (0.0%)
All	All	0.15	0/16961	0.43	7/23088 (0.0%)

There are no bond length outliers.

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	375	ASN	CA-C-N	-10.21	113.38	122.47
2	C	375	ASN	C-N-CA	-10.21	113.38	122.47
2	C	532	VAL	N-CA-C	-6.08	107.93	113.71
1	A	3320	VAL	N-CA-C	-5.39	108.59	113.71
2	C	623	VAL	CA-C-N	5.21	135.03	126.86
2	C	623	VAL	C-N-CA	5.21	135.03	126.86
2	D	522	ILE	N-CA-C	-5.02	107.84	111.90

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	5636	0	5449	121	0
2	B	3938	0	3897	45	0
2	C	3858	0	3818	53	0
2	D	3136	0	2473	43	0
3	A	30	46	0	13	0
4	B	42	0	39	1	0
4	C	42	0	39	0	0
All	All	16682	46	15715	262	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 8.

All (262) 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)
3:A:4401:A1EQ3:C14	3:A:4401:A1EQ3:C06	1.78	1.60
3:A:4401:A1EQ3:C07	3:A:4401:A1EQ3:C10	1.79	1.56
3:A:4401:A1EQ3:C13	3:A:4401:A1EQ3:C11	1.75	1.43
1:A:3753:ARG:O	1:A:3754:LEU:HG	1.18	1.35
1:A:3753:ARG:O	1:A:3754:LEU:CG	1.87	1.22
1:A:3306:ALA:O	1:A:3308:SER:N	1.73	1.22
1:A:3754:LEU:HD12	1:A:3756:GLU:H	0.91	1.08
1:A:3754:LEU:HD21	1:A:3846:ARG:HB3	1.08	1.06
1:A:3754:LEU:HD11	1:A:3846:ARG:HG2	1.39	1.00
1:A:3754:LEU:HD12	1:A:3756:GLU:N	1.76	0.99
1:A:3754:LEU:CD2	1:A:3846:ARG:HB3	1.94	0.97
1:A:3297:VAL:O	1:A:3301:ALA:HB3	1.68	0.92
1:A:3854:LEU:HD12	1:A:3855:THR:N	1.88	0.87
1:A:3854:LEU:HD12	1:A:3855:THR:H	1.41	0.84
1:A:3753:ARG:O	1:A:3754:LEU:CD2	2.26	0.84
1:A:3754:LEU:CD1	1:A:3756:GLU:H	1.84	0.83
3:A:4401:A1EQ3:C06	3:A:4401:A1EQ3:C10	2.58	0.80
3:A:4401:A1EQ3:C14	3:A:4401:A1EQ3:C07	2.56	0.79
2:C:585:GLN:HE22	2:C:688:LYS:HE3	1.47	0.78
1:A:3306:ALA:C	1:A:3308:SER:H	1.90	0.78
1:A:4107:ARG:HH22	2:D:681:ASN:HD21	1.32	0.78
3:A:4401:A1EQ3:C07	3:A:4401:A1EQ3:C18	2.62	0.77
2:C:345:TYR:O	2:C:420:ARG:NH2	2.18	0.76
2:C:375:ASN:HB2	2:C:547:ASN:ND2	2.00	0.76
1:A:3306:ALA:C	1:A:3308:SER:N	2.45	0.75
2:D:227:TYR:OH	2:D:572:LYS:O	2.05	0.74
2:D:325:ARG:HA	2:D:419:THR:HA	1.69	0.73

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:623:VAL:HG12	2:B:625:ASP:H	1.52	0.73
1:A:3753:ARG:C	1:A:3754:LEU:HG	2.13	0.73
1:A:4022:ALA:HB2	1:A:4109:ARG:HG3	1.71	0.71
2:B:238:THR:HA	2:B:241:MET:HE3	1.74	0.70
1:A:3755:GLN:HB2	1:A:3777:SER:HB2	1.73	0.70
2:B:433:ILE:HD12	2:B:435:LEU:HD12	1.74	0.69
2:B:511:ASP:OD1	2:B:572:LYS:NZ	2.24	0.69
1:A:3290:LEU:HB3	1:A:3333:VAL:HG21	1.76	0.68
2:C:320:ARG:NH1	2:C:374:LEU:HD11	2.09	0.68
1:A:3269:ARG:HH11	1:A:3277:ARG:HB2	1.58	0.67
1:A:3343:LEU:HD22	1:A:3558:ALA:HB2	1.77	0.67
2:C:533:GLU:HA	2:C:536:LEU:HD23	1.76	0.66
3:A:4401:A1EQ3:C07	3:A:4401:A1EQ3:C20	2.72	0.66
2:D:670:PHE:O	2:D:674:ASN:ND2	2.29	0.66
1:A:3306:ALA:O	1:A:3307:TYR:C	2.39	0.66
2:D:681:ASN:C	2:D:681:ASN:HD22	2.05	0.64
2:C:323:GLN:HE21	2:C:419:THR:HG22	1.64	0.63
2:D:636:GLN:NE2	2:D:660:TYR:OH	2.31	0.63
3:A:4401:A1EQ3:C14	3:A:4401:A1EQ3:C05	2.73	0.61
2:C:225:VAL:O	2:C:229:LEU:HG	2.00	0.61
1:A:3255:ARG:HD3	1:A:3624:PRO:HB2	1.82	0.60
2:C:396:SER:H	2:C:402:THR:HG22	1.66	0.60
3:A:4401:A1EQ3:C10	3:A:4401:A1EQ3:C12	2.77	0.60
1:A:3755:GLN:HA	1:A:3846:ARG:HH21	1.65	0.60
2:C:291:LEU:HD11	2:C:315:LEU:HD13	1.84	0.60
2:C:593:CYS:HB3	2:C:683:THR:HG21	1.83	0.59
3:A:4401:A1EQ3:C07	3:A:4401:A1EQ3:C17	2.71	0.59
2:C:227:TYR:OH	2:C:569:VAL:O	2.21	0.59
1:A:4091:TRP:CG	1:A:4092:ALA:H	2.20	0.59
2:B:313:ASN:OD1	2:B:430:ASN:ND2	2.29	0.58
2:B:499:LYS:NZ	2:B:500:LEU:O	2.28	0.58
2:C:375:ASN:HB2	2:C:547:ASN:HD21	1.67	0.58
2:C:597:LEU:HD13	2:D:671:ILE:HD12	1.85	0.58
2:D:292:TYR:HA	2:D:306:ARG:H	1.69	0.58
2:C:500:LEU:HD12	2:C:501:HIS:H	1.66	0.58
1:A:3867:VAL:HG22	1:A:3885:VAL:HG22	1.86	0.58
2:C:681:ASN:HD22	2:C:681:ASN:C	2.08	0.57
2:B:526:ILE:O	2:B:530:SER:OG	2.19	0.57
1:A:3066:PHE:HD1	1:A:3575:TRP:HH2	1.52	0.57
2:C:234:LEU:HD23	2:C:569:VAL:HG11	1.85	0.57
1:A:3846:ARG:HD3	1:A:3846:ARG:H	1.70	0.57

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:A:4401:A1EQ3:C06	3:A:4401:A1EQ3:C19	2.76	0.57
2:C:374:LEU:O	2:C:376:GLY:N	2.38	0.57
1:A:3749:LEU:HB2	1:A:3821:GLN:HB2	1.86	0.56
1:A:3655:PHE:N	1:A:3658:LYS:HZ2	2.04	0.56
1:A:3297:VAL:O	1:A:3301:ALA:CB	2.50	0.56
1:A:3993:SER:O	1:A:3996:PHE:HB3	2.05	0.56
4:B:1003:NAG:H83	4:B:1003:NAG:H3	1.88	0.56
2:C:328:ASN:OD1	2:C:329:GLY:N	2.38	0.56
2:D:228:LEU:O	2:D:232:ILE:HD12	2.06	0.56
2:C:371:GLU:O	2:C:374:LEU:O	2.23	0.56
1:A:4108:TRP:CH2	2:D:688:LYS:HE2	2.41	0.56
2:B:328:ASN:OD1	2:B:329:GLY:N	2.39	0.56
1:A:3753:ARG:O	1:A:3754:LEU:HD23	2.04	0.56
2:B:249:TYR:HE1	2:B:313:ASN:HD21	1.54	0.56
1:A:3750:ARG:NH1	1:A:3815:ASP:O	2.40	0.55
1:A:3966:PHE:HA	1:A:3975:THR:HG21	1.87	0.55
1:A:3798:SER:OG	1:A:3818:GLY:O	2.25	0.54
1:A:3854:LEU:CD1	1:A:3855:THR:H	2.16	0.54
1:A:3724:TRP:HZ2	1:A:3843:LEU:HB3	1.71	0.54
2:B:528:ARG:NH2	2:B:558:PHE:CD2	2.76	0.54
1:A:3770:CYS:HB3	1:A:3874:PRO:HB3	1.90	0.54
2:C:537:GLN:O	2:C:542:GLN:NE2	2.40	0.54
2:D:566:VAL:HA	2:D:569:VAL:HG12	1.89	0.54
1:A:3753:ARG:C	1:A:3754:LEU:CG	2.74	0.53
1:A:3751:GLN:HE22	1:A:3847:SER:HA	1.74	0.53
2:D:553:TYR:HA	2:D:556:ILE:HD12	1.90	0.53
1:A:3754:LEU:HD11	1:A:3846:ARG:CG	2.27	0.53
2:C:608:PHE:HE2	2:C:633:ILE:HG23	1.74	0.53
2:D:559:ASN:OD1	2:D:560:ASN:ND2	2.39	0.53
1:A:3736:HIS:NE2	1:A:3825:LEU:O	2.31	0.52
1:A:3766:ARG:HD2	1:A:3769:THR:HA	1.91	0.52
2:C:324:LEU:HB2	2:C:421:ALA:HB3	1.91	0.52
1:A:3841:ASN:OD1	1:A:3844:ASP:HB2	2.08	0.52
2:B:681:ASN:C	2:B:681:ASN:HD22	2.14	0.52
2:B:577:ILE:HG13	2:B:577:ILE:O	2.09	0.52
1:A:3562:SER:O	1:A:3566:VAL:HG22	2.10	0.52
1:A:4108:TRP:CH2	2:D:688:LYS:CE	2.93	0.52
2:C:320:ARG:NH1	2:C:374:LEU:CD1	2.73	0.52
1:A:3757:ALA:HA	1:A:3846:ARG:CG	2.40	0.52
2:C:346:ASP:OD1	2:C:347:VAL:N	2.43	0.52
1:A:3754:LEU:HA	1:A:3776:PHE:HA	1.91	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:248:TYR:O	2:B:252:MET:HG2	2.10	0.52
1:A:3856:ARG:HB3	1:A:3865:ALA:HB3	1.93	0.51
1:A:4038:VAL:HG23	2:D:239:TYR:HD1	1.76	0.51
2:D:521:ALA:HA	2:D:524:ILE:HB	1.92	0.51
1:A:3725:PRO:O	1:A:3729:HIS:ND1	2.43	0.51
1:A:4025:GLU:OE2	3:A:4401:A1EQ3:C25	2.57	0.51
2:B:539:LEU:HD13	2:C:336:ASP:HB3	1.93	0.51
1:A:3347:SER:HA	1:A:3551:PRO:HB2	1.92	0.51
1:A:3753:ARG:O	1:A:3754:LEU:CB	2.58	0.50
2:D:231:LEU:HD23	2:D:572:LYS:NZ	2.27	0.50
1:A:3754:LEU:O	1:A:3775:GLY:O	2.30	0.50
2:C:398:THR:OG1	2:C:401:GLU:OE1	2.28	0.50
2:B:518:SER:O	2:B:522:ILE:HG13	2.12	0.50
2:D:224:LEU:O	2:D:228:LEU:HG	2.12	0.50
2:D:623:VAL:HG12	2:D:625:ASP:H	1.76	0.50
1:A:3811:CYS:SG	1:A:3848:ARG:NH2	2.84	0.49
1:A:3724:TRP:HB2	1:A:3725:PRO:HD3	1.93	0.49
2:C:246:VAL:O	2:C:250:THR:HG23	2.13	0.49
2:C:313:ASN:HD22	2:C:428:VAL:HG21	1.76	0.49
2:D:227:TYR:CE1	2:D:575:LYS:HD3	2.48	0.49
2:B:346:ASP:OD1	2:B:347:VAL:N	2.46	0.48
2:D:500:LEU:HD23	2:D:500:LEU:H	1.78	0.48
1:A:3334:TYR:CZ	1:A:3338:LEU:HD11	2.47	0.48
2:D:492:ILE:HG13	2:D:493:LEU:HD12	1.96	0.48
2:D:620:GLY:HA2	2:D:626:PHE:O	2.13	0.48
1:A:3325:VAL:HA	1:A:3328:VAL:HG22	1.95	0.48
1:A:3123:LEU:HA	1:A:3167:ILE:HA	1.95	0.48
1:A:3827:LEU:HD11	1:A:3831:ARG:HH21	1.79	0.47
2:C:375:ASN:CB	2:C:547:ASN:ND2	2.73	0.47
2:B:435:LEU:HD23	2:B:461:LYS:HB2	1.97	0.47
1:A:4101:LEU:O	1:A:4104:VAL:HG22	2.14	0.47
2:D:231:LEU:HD23	2:D:572:LYS:HZ3	1.79	0.47
1:A:4033:LEU:HB2	1:A:4096:TRP:CZ2	2.49	0.47
2:D:559:ASN:OD1	2:D:560:ASN:N	2.47	0.47
1:A:3726:TRP:O	1:A:3730:VAL:HG12	2.14	0.47
2:C:470:ASP:HA	2:C:473:LEU:HB2	1.96	0.47
2:D:445:PHE:HA	2:D:451:VAL:HA	1.97	0.47
1:A:3063:ARG:HD3	1:A:3305:SER:HB3	1.96	0.47
2:B:492:ILE:HA	2:B:495:ILE:HG22	1.98	0.46
1:A:3605:PRO:HA	1:A:3608:VAL:HG22	1.97	0.46
1:A:4107:ARG:HH22	2:D:681:ASN:ND2	2.08	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3275:PHE:CE2	1:A:3280:ARG:HG2	2.51	0.46
2:D:568:PHE:HA	2:D:571:ILE:HB	1.97	0.46
1:A:3872:GLU:O	1:A:3879:ALA:HA	2.15	0.46
2:B:430:ASN:HD21	2:C:448:THR:HA	1.79	0.46
2:D:494:GLU:O	2:D:498:HIS:HB3	2.16	0.46
1:A:3699:TYR:O	1:A:3702:GLN:HG3	2.16	0.46
2:C:423:PHE:CE1	2:C:442:LEU:HD13	2.51	0.46
2:B:468:THR:HA	2:B:471:PHE:HD2	1.80	0.46
2:C:592:ARG:HH21	2:C:687:VAL:HG23	1.81	0.46
2:D:232:ILE:O	2:D:236:ILE:HG13	2.16	0.46
1:A:3747:PRO:HG2	1:A:3823:LEU:HB3	1.98	0.46
2:B:227:TYR:CE1	2:B:572:LYS:HD3	2.50	0.46
2:B:289:ASP:OD1	2:B:399:ARG:NH1	2.49	0.46
2:D:510:LEU:HA	2:D:513:VAL:HG12	1.97	0.46
2:B:423:PHE:CE2	2:B:442:LEU:HD13	2.51	0.46
1:A:4091:TRP:CG	1:A:4092:ALA:N	2.83	0.46
2:C:313:ASN:HA	2:C:430:ASN:HA	1.98	0.45
2:B:528:ARG:NH2	2:B:558:PHE:CE2	2.84	0.45
1:A:3814:TYR:CD2	1:A:3851:PHE:HZ	2.33	0.45
1:A:3572:VAL:O	1:A:3576:VAL:HG12	2.16	0.45
1:A:3854:LEU:O	1:A:3855:THR:HB	2.17	0.45
2:B:668:MET:HA	2:B:672:LEU:HB2	1.99	0.45
2:C:337:LEU:H	2:C:337:LEU:HD23	1.81	0.45
2:B:309:ILE:HD12	2:B:428:VAL:HG11	1.99	0.45
1:A:4107:ARG:NH2	2:D:681:ASN:HD21	2.09	0.44
1:A:3249:LEU:HD11	1:A:3613:LEU:HD13	1.99	0.44
2:B:533:GLU:O	2:B:537:GLN:HG3	2.18	0.44
2:C:312:GLU:OE1	2:C:312:GLU:N	2.49	0.44
2:D:498:HIS:CE1	2:D:499:LYS:HG2	2.52	0.44
1:A:3873:PHE:HE1	1:A:3879:ALA:HB2	1.82	0.44
2:B:232:ILE:O	2:B:236:ILE:HG12	2.18	0.44
2:C:681:ASN:C	2:C:681:ASN:ND2	2.74	0.44
1:A:3253:LEU:O	1:A:3257:PHE:HB2	2.17	0.44
2:B:617:LEU:HD23	2:B:617:LEU:HA	1.81	0.44
2:B:494:GLU:O	2:B:498:HIS:HB2	2.17	0.44
1:A:3569:ALA:O	1:A:3572:VAL:HG12	2.18	0.43
1:A:3275:PHE:O	1:A:3276:THR:OG1	2.34	0.43
2:B:486:TYR:O	2:B:490:GLU:HG2	2.18	0.43
1:A:3245:PHE:O	1:A:3249:LEU:HD23	2.18	0.43
2:C:415:LEU:HD13	2:C:419:THR:HG21	2.00	0.43
2:C:491:GLU:OE1	2:C:491:GLU:HA	2.18	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:3091:MET:HG3	1:A:3671:LEU:HD11	2.01	0.43
1:A:3922:TRP:CZ3	1:A:3929:ARG:HB3	2.54	0.43
1:A:3552:ALA:HB3	1:A:3553:TRP:HE3	1.83	0.43
2:D:465:TYR:HA	2:D:470:ASP:OD2	2.18	0.43
2:D:485:PHE:HA	2:D:488:VAL:HG12	2.00	0.43
1:A:3854:LEU:HD12	1:A:3855:THR:O	2.19	0.43
1:A:3951:VAL:HG12	1:A:3987:ALA:HB2	1.99	0.43
1:A:4021:ARG:HG3	1:A:4109:ARG:HH11	1.83	0.43
2:B:610:ALA:O	2:B:613:GLN:HG3	2.19	0.43
2:C:476:CYS:HA	2:C:479:ILE:HG22	2.01	0.43
1:A:3260:LYS:HB2	1:A:3608:VAL:HG12	2.01	0.42
1:A:3269:ARG:H	1:A:3277:ARG:NH1	2.18	0.42
1:A:3333:VAL:O	1:A:3336:VAL:HG12	2.19	0.42
2:B:416:ASP:O	2:B:419:THR:HG22	2.18	0.42
1:A:3559:HIS:O	1:A:3562:SER:OG	2.28	0.42
1:A:3684:THR:HG21	1:A:3998:LEU:HD22	2.01	0.42
1:A:3755:GLN:O	1:A:3755:GLN:HG2	2.19	0.42
2:B:672:LEU:HD23	2:B:672:LEU:HA	1.92	0.42
1:A:3315:LEU:HD11	1:A:3897:LEU:H	1.84	0.42
2:B:575:LYS:HD2	2:B:576:PHE:HE1	1.85	0.42
2:D:565:THR:HG23	2:D:566:VAL:HG13	2.01	0.42
1:A:4001:LYS:HE3	1:A:4001:LYS:HB2	1.66	0.42
2:C:675:MET:O	2:C:679:ILE:HG13	2.20	0.42
1:A:3723:LEU:HD22	1:A:3871:LEU:HD12	2.02	0.42
1:A:3751:GLN:NE2	1:A:3752:VAL:O	2.53	0.42
2:B:249:TYR:HE1	2:B:313:ASN:ND2	2.17	0.42
2:B:306:ARG:NH1	2:C:340:GLU:OE1	2.38	0.42
2:C:562:ALA:HA	2:C:565:THR:HG22	2.01	0.42
1:A:4091:TRP:O	1:A:4093:LEU:N	2.53	0.41
2:D:480:PHE:O	2:D:484:ILE:HG12	2.20	0.41
1:A:3748:ARG:NH2	1:A:3750:ARG:HD3	2.35	0.41
1:A:3761:ASP:HB2	1:A:3762:PRO:HD2	2.02	0.41
3:A:4401:A1EQ3:C06	3:A:4401:A1EQ3:O01	2.50	0.41
2:C:500:LEU:CD1	2:C:501:HIS:H	2.33	0.41
2:C:519:VAL:O	2:C:522:ILE:HG22	2.20	0.41
1:A:3801:ASP:OD1	1:A:3802:LEU:HD23	2.21	0.41
1:A:4109:ARG:HA	1:A:4109:ARG:HD3	1.84	0.41
1:A:3931:LEU:O	2:D:222:ARG:NH2	2.54	0.41
2:B:379:HIS:CE1	2:B:442:LEU:HD22	2.55	0.41
1:A:4042:GLN:HE21	1:A:4043:LEU:HD12	1.85	0.41
2:B:336:ASP:OD1	2:B:336:ASP:N	2.54	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:B:354:ASP:OD1	2:B:355:ARG:N	2.53	0.41
2:B:673:LEU:HD12	2:B:673:LEU:HA	1.90	0.41
2:C:510:LEU:O	2:C:514:ILE:HG13	2.20	0.41
2:C:493:LEU:O	2:C:497:ILE:HG12	2.21	0.41
1:A:3873:PHE:CE1	1:A:3879:ALA:HB2	2.55	0.41
1:A:3287:LEU:HD21	1:A:3337:TYR:CG	2.56	0.41
1:A:3996:PHE:HD1	2:B:610:ALA:HB1	1.86	0.41
1:A:3276:THR:O	1:A:3278:ILE:HG22	2.21	0.41
1:A:3930:VAL:O	1:A:3931:LEU:HB2	2.20	0.41
2:C:600:PHE:CE1	2:C:675:MET:HG2	2.56	0.41
1:A:3260:LYS:HB3	1:A:3260:LYS:HE3	1.95	0.41
2:B:636:GLN:O	2:B:640:ILE:HG12	2.20	0.41
2:C:397:ARG:HH12	2:C:541:ASP:HB3	1.85	0.40
1:A:3261:HIS:CE1	1:A:3263:TRP:HB2	2.55	0.40
2:B:646:PHE:HB3	2:B:661:PHE:CD2	2.57	0.40
2:B:673:LEU:HD11	2:C:670:PHE:CE1	2.56	0.40
1:A:3855:THR:OG1	1:A:3856:ARG:N	2.55	0.40
2:C:224:LEU:O	2:C:228:LEU:HD23	2.22	0.40
2:D:229:LEU:O	2:D:233:VAL:HG23	2.22	0.40
2:D:531:ASN:C	2:D:554:TRP:HE1	2.28	0.40
1:A:3722:GLU:C	1:A:3725:PRO:HD2	2.47	0.40
1:A:3781:TYR:HD2	1:A:3786:GLU:HB2	1.87	0.40
2:D:480:PHE:HE2	2:D:522:ILE:HD11	1.86	0.40
1:A:3287:LEU:HD21	1:A:3337:TYR:CD1	2.56	0.40
1:A:3899:LEU:N	1:A:3900:PRO:HD2	2.37	0.40
1:A:4023:LEU:HB3	1:A:4024:PRO:HD3	2.03	0.40
2:C:489:VAL:O	2:C:492:ILE:HG22	2.21	0.40
2:C:623:VAL:O	2:C:624:ASP:OD1	2.39	0.40
2:D:427:SER:HA	2:D:437:CYS:O	2.21	0.40
2:D:648:GLU:HA	2:D:651:GLU:HB3	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles

5.3.1 Protein backbone

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	747/1261 (59%)	676 (90%)	68 (9%)	3 (0%)	30	60
2	B	472/1007 (47%)	439 (93%)	33 (7%)	0	100	100
2	C	463/1007 (46%)	439 (95%)	23 (5%)	1 (0%)	44	72
2	D	470/1007 (47%)	428 (91%)	42 (9%)	0	100	100
All	All	2152/4282 (50%)	1982 (92%)	166 (8%)	4 (0%)	45	72

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	3307	TYR
2	C	375	ASN
1	A	3754	LEU
1	A	4092	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	A	521/1041 (50%)	521 (100%)	0	100	100
2	B	431/860 (50%)	431 (100%)	0	100	100
2	C	422/860 (49%)	422 (100%)	0	100	100
2	D	212/860 (25%)	212 (100%)	0	100	100
All	All	1586/3621 (44%)	1586 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (14) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	3751	GLN
1	A	3789	HIS

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Mol	Chain	Res	Type
2	B	547	ASN
2	B	636	GLN
2	B	681	ASN
2	C	313	ASN
2	C	323	GLN
2	C	501	HIS
2	C	547	ASN
2	C	585	GLN
2	C	622	GLN
2	C	681	ASN
2	D	636	GLN
2	D	674	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

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

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

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

7 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z > 2$	Counts	RMSZ	$\# Z > 2$
4	NAG	C	1001	-	14,14,15	0.31	0	17,19,21	0.60	0
3	A1EQ3	A	4401	-	33,33,33	7.05	18 (54%)	48,51,51	2.57	15 (31%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
4	NAG	B	1003	2	14,14,15	0.44	0	17,19,21	1.27	2 (11%)
4	NAG	C	1002	2	14,14,15	0.24	0	17,19,21	0.46	0
4	NAG	C	1003	2	14,14,15	0.97	1 (7%)	17,19,21	1.21	1 (5%)
4	NAG	B	1002	2	14,14,15	0.39	0	17,19,21	0.34	0
4	NAG	B	1001	2	14,14,15	0.29	0	17,19,21	0.56	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	NAG	C	1001	-	-	5/6/23/26	0/1/1/1
3	A1EQ3	A	4401	-	-	3/12/73/73	0/4/4/4
4	NAG	B	1003	2	-	5/6/23/26	0/1/1/1
4	NAG	C	1002	2	-	2/6/23/26	0/1/1/1
4	NAG	C	1003	2	-	3/6/23/26	0/1/1/1
4	NAG	B	1002	2	-	2/6/23/26	0/1/1/1
4	NAG	B	1001	2	-	3/6/23/26	0/1/1/1

All (19) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	4401	A1EQ3	C06-C14	22.09	1.78	1.53
3	A	4401	A1EQ3	C19-C17	15.68	1.61	1.33
3	A	4401	A1EQ3	C09-C04	-15.01	1.27	1.54
3	A	4401	A1EQ3	C10-C07	14.02	1.79	1.56
3	A	4401	A1EQ3	C06-C07	-12.56	1.29	1.53
3	A	4401	A1EQ3	O01-C14	-7.71	1.28	1.43
3	A	4401	A1EQ3	C11-C13	7.67	1.75	1.54
3	A	4401	A1EQ3	C15-C08	-6.75	1.42	1.54
3	A	4401	A1EQ3	C04-C08	6.66	1.67	1.55
3	A	4401	A1EQ3	C11-C05	5.42	1.65	1.54
3	A	4401	A1EQ3	C12-C07	4.09	1.60	1.53
3	A	4401	A1EQ3	C09-C12	4.08	1.62	1.53
4	C	1003	NAG	O5-C1	3.33	1.49	1.43
3	A	4401	A1EQ3	C21-C24	-3.32	1.46	1.52
3	A	4401	A1EQ3	C10-C17	-3.20	1.46	1.52
3	A	4401	A1EQ3	C21-C17	2.53	1.57	1.51
3	A	4401	A1EQ3	C06-C05	2.39	1.58	1.53

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	4401	A1EQ3	C23-C15	2.15	1.59	1.54
3	A	4401	A1EQ3	C14-C19	2.10	1.53	1.50

All (18) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	A	4401	A1EQ3	C14-C19-C17	-10.51	118.58	125.42
3	A	4401	A1EQ3	C21-C17-C19	5.72	125.26	120.77
3	A	4401	A1EQ3	C04-C08-C15	-4.77	112.02	119.49
4	C	1003	NAG	C1-O5-C5	4.60	118.43	112.19
4	B	1003	NAG	C2-N2-C7	4.26	128.97	122.90
3	A	4401	A1EQ3	C08-C04-C05	3.75	104.52	100.07
3	A	4401	A1EQ3	C09-C04-C05	3.63	112.90	107.27
3	A	4401	A1EQ3	C21-C17-C10	-3.55	111.71	116.42
3	A	4401	A1EQ3	C16-C04-C09	-3.51	105.05	110.59
3	A	4401	A1EQ3	C09-C04-C08	3.46	121.75	116.57
3	A	4401	A1EQ3	C16-C04-C05	-3.39	105.39	111.71
3	A	4401	A1EQ3	C18-C10-C07	-3.14	104.34	108.73
3	A	4401	A1EQ3	C16-C04-C08	-3.07	105.99	111.71
3	A	4401	A1EQ3	C12-C07-C10	-3.05	109.06	113.08
3	A	4401	A1EQ3	C11-C05-C06	2.94	122.45	118.33
3	A	4401	A1EQ3	C25-C15-C08	-2.16	109.62	112.92
3	A	4401	A1EQ3	C07-C10-C17	2.01	112.80	109.65
4	B	1003	NAG	C1-C2-N2	2.01	113.92	110.49

There are no chirality outliers.

All (23) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	C	1001	NAG	O7-C7-N2-C2
4	C	1001	NAG	C8-C7-N2-C2
4	B	1001	NAG	C4-C5-C6-O6
4	B	1002	NAG	O5-C5-C6-O6
4	B	1003	NAG	O5-C5-C6-O6
4	C	1002	NAG	O5-C5-C6-O6
4	B	1002	NAG	C4-C5-C6-O6
4	B	1001	NAG	O5-C5-C6-O6
4	B	1003	NAG	C8-C7-N2-C2
4	B	1003	NAG	O7-C7-N2-C2
4	C	1003	NAG	O5-C5-C6-O6
4	B	1003	NAG	C4-C5-C6-O6
4	C	1001	NAG	O5-C5-C6-O6

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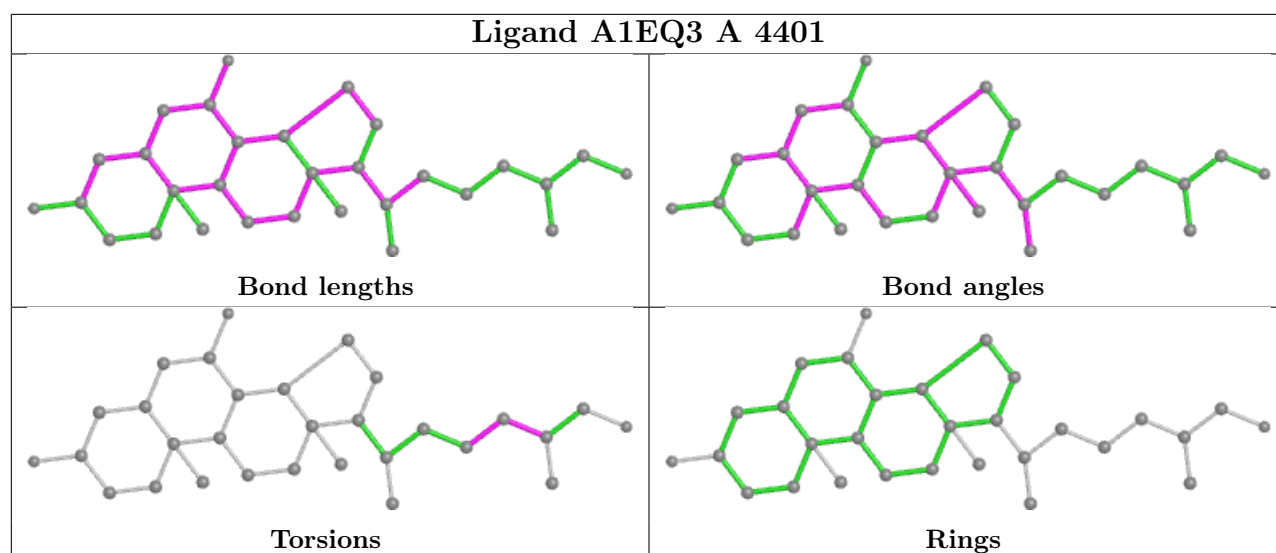
Mol	Chain	Res	Type	Atoms
4	C	1002	NAG	C4-C5-C6-O6
4	C	1001	NAG	C1-C2-N2-C7
3	A	4401	A1EQ3	C26-C27-C28-C30
3	A	4401	A1EQ3	C23-C26-C27-C28
3	A	4401	A1EQ3	C26-C27-C28-C29
4	C	1003	NAG	C4-C5-C6-O6
4	B	1001	NAG	C3-C2-N2-C7
4	C	1003	NAG	C3-C2-N2-C7
4	B	1003	NAG	C3-C2-N2-C7
4	C	1001	NAG	C3-C2-N2-C7

There are no ring outliers.

2 monomers are involved in 14 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	4401	A1EQ3	13	0
4	B	1003	NAG	1	0

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



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.

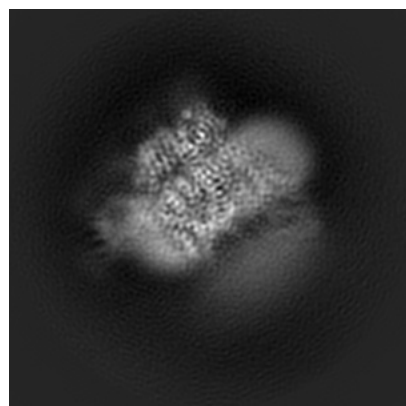
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-60222. These allow visual inspection of the internal detail of the map and identification of artifacts.

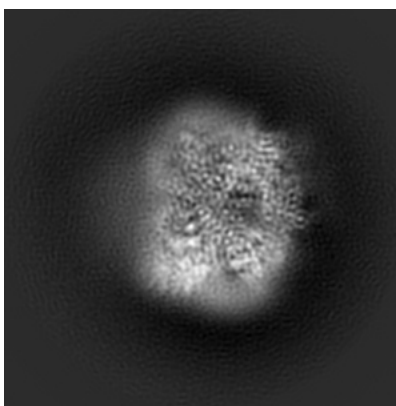
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

6.1 Orthogonal projections [i](#)

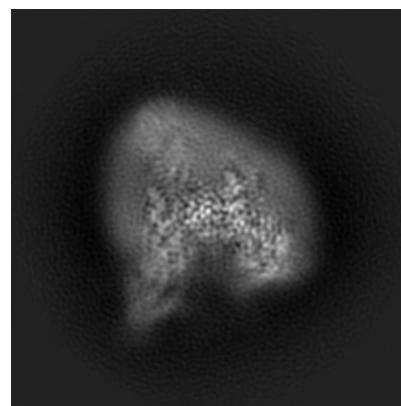
6.1.1 Primary map



X

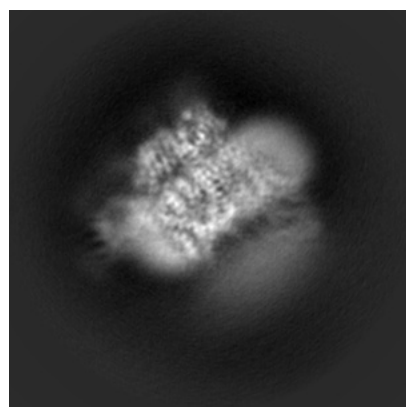


Y

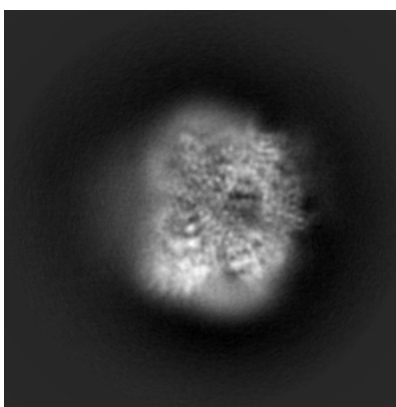


Z

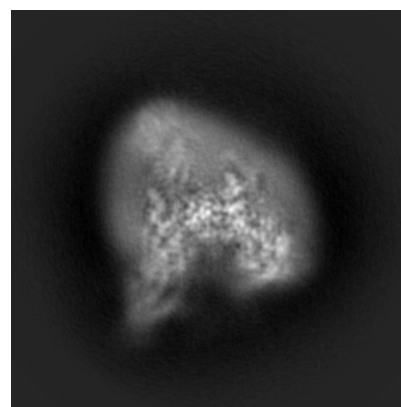
6.1.2 Raw map



X



Y

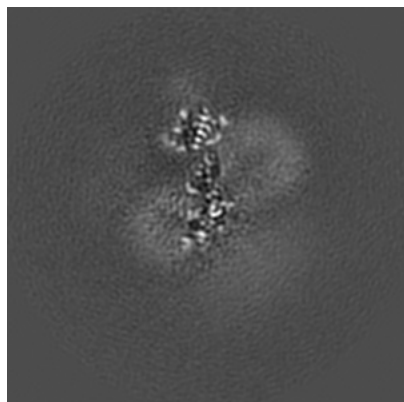


Z

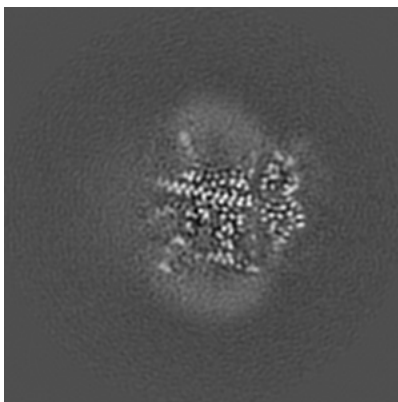
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

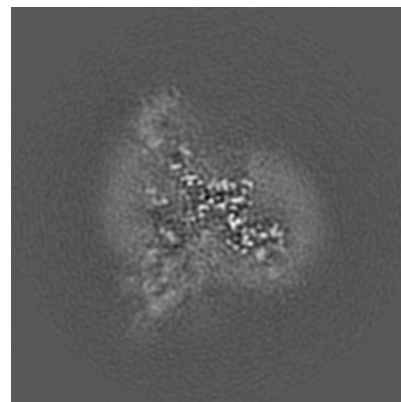
6.2.1 Primary map



X Index: 120

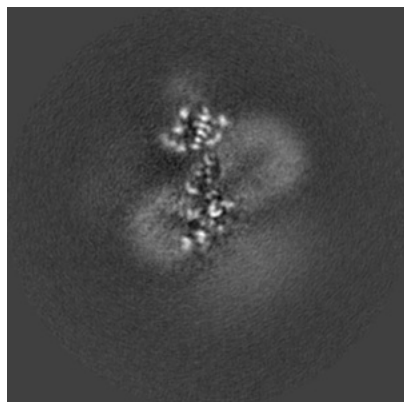


Y Index: 120

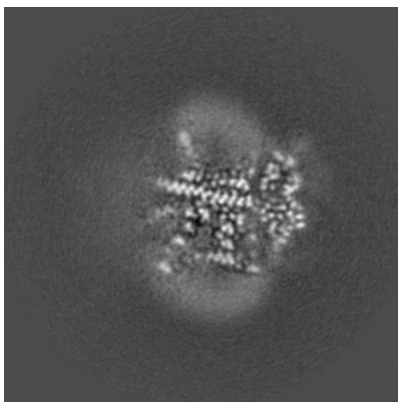


Z Index: 120

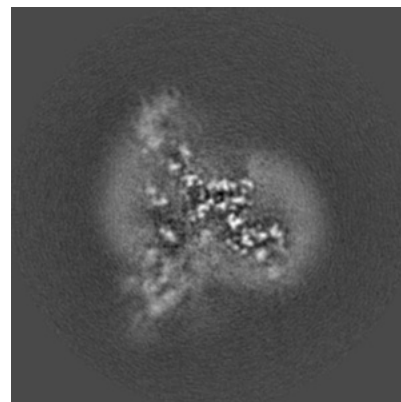
6.2.2 Raw map



X Index: 120



Y Index: 120

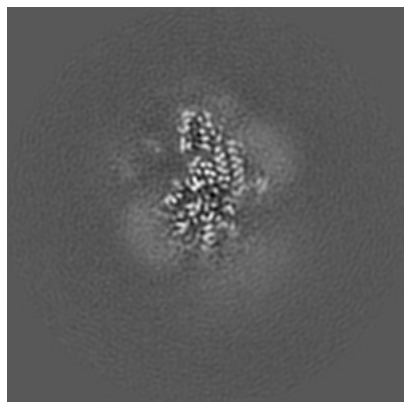


Z Index: 120

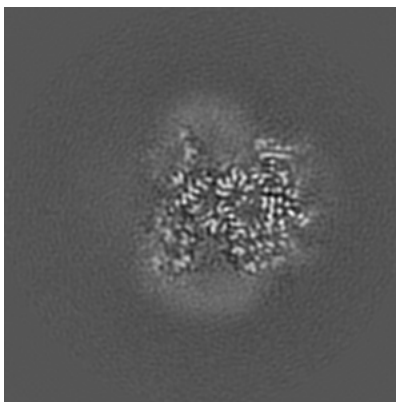
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

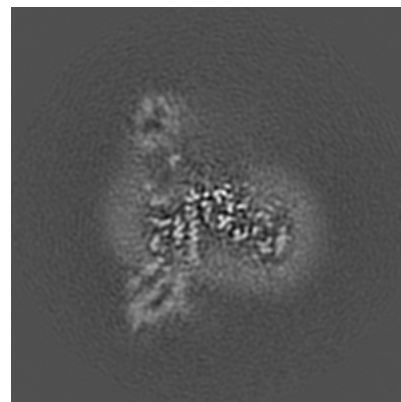
6.3.1 Primary map



X Index: 132

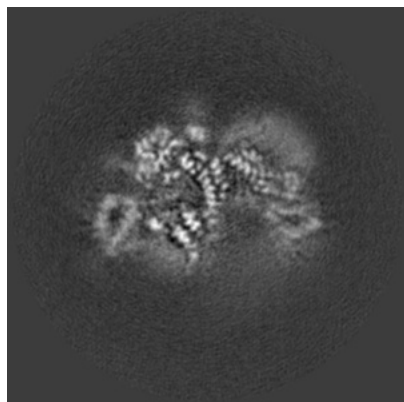


Y Index: 113

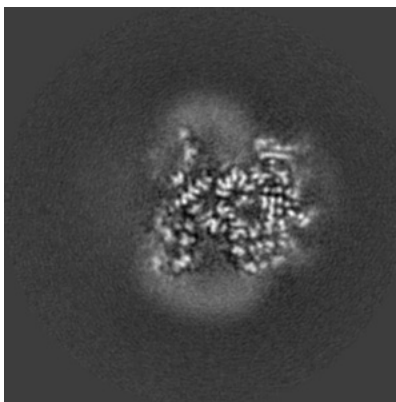


Z Index: 112

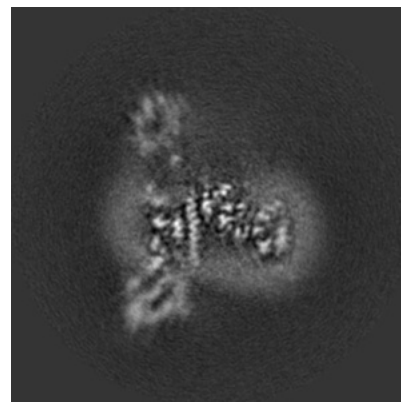
6.3.2 Raw map



X Index: 89



Y Index: 113

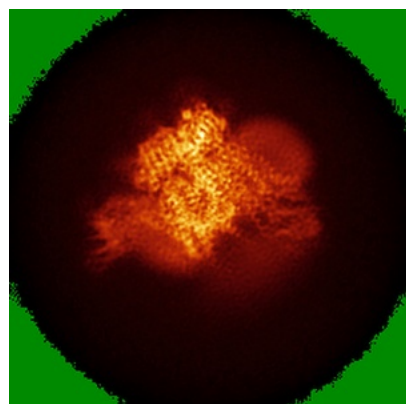


Z Index: 111

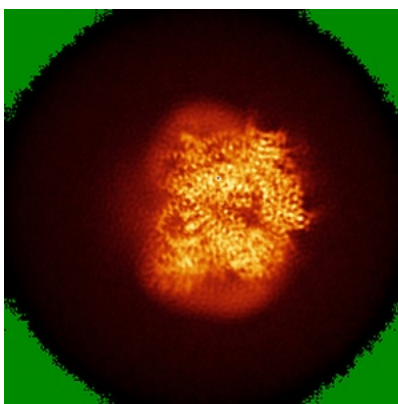
The images above show the largest variance slices of the map in three orthogonal directions.

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

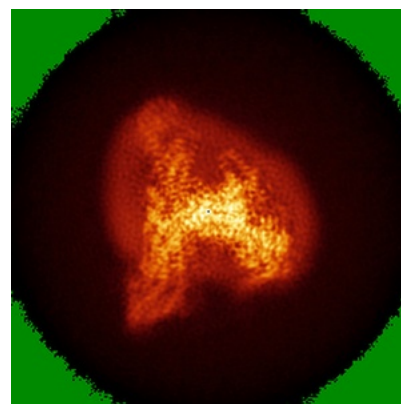
6.4.1 Primary map



X

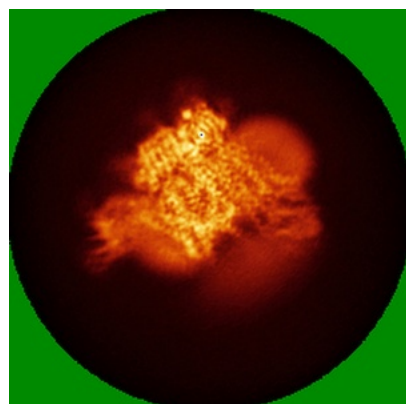


Y

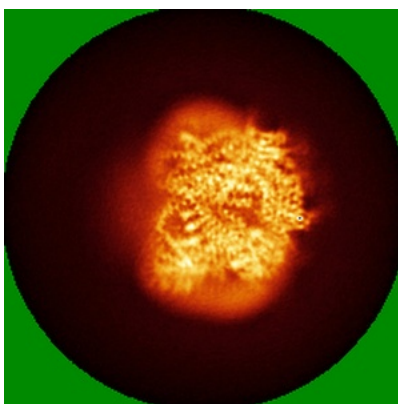


Z

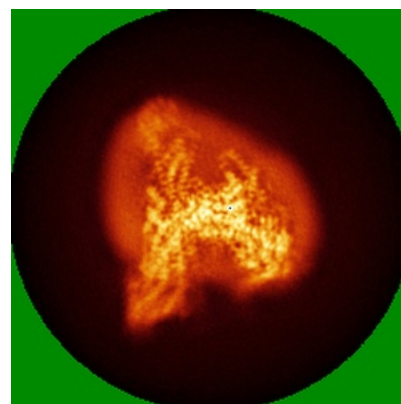
6.4.2 Raw map



X



Y

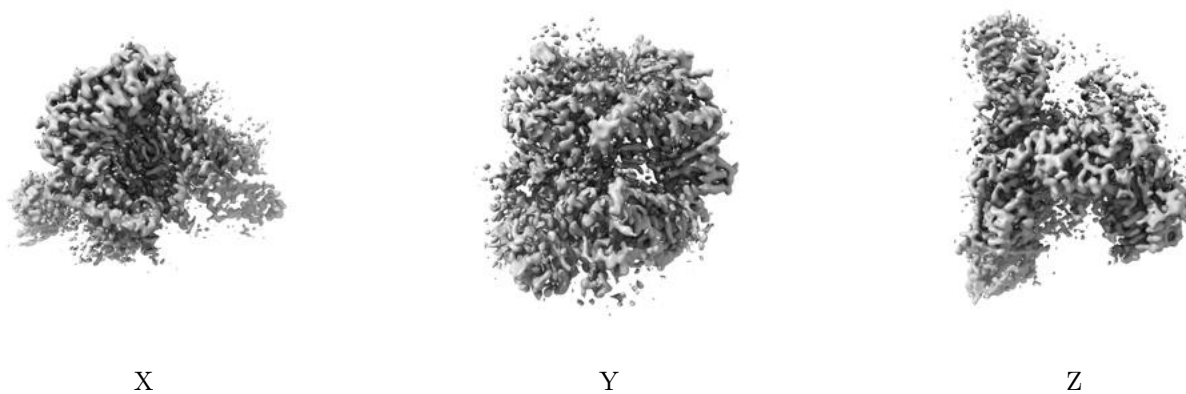


Z

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.

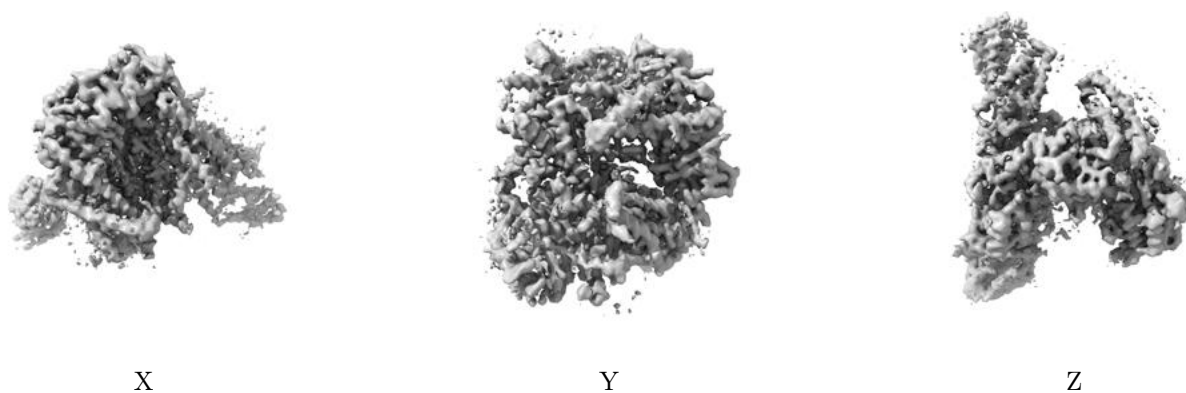
6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.018. 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.

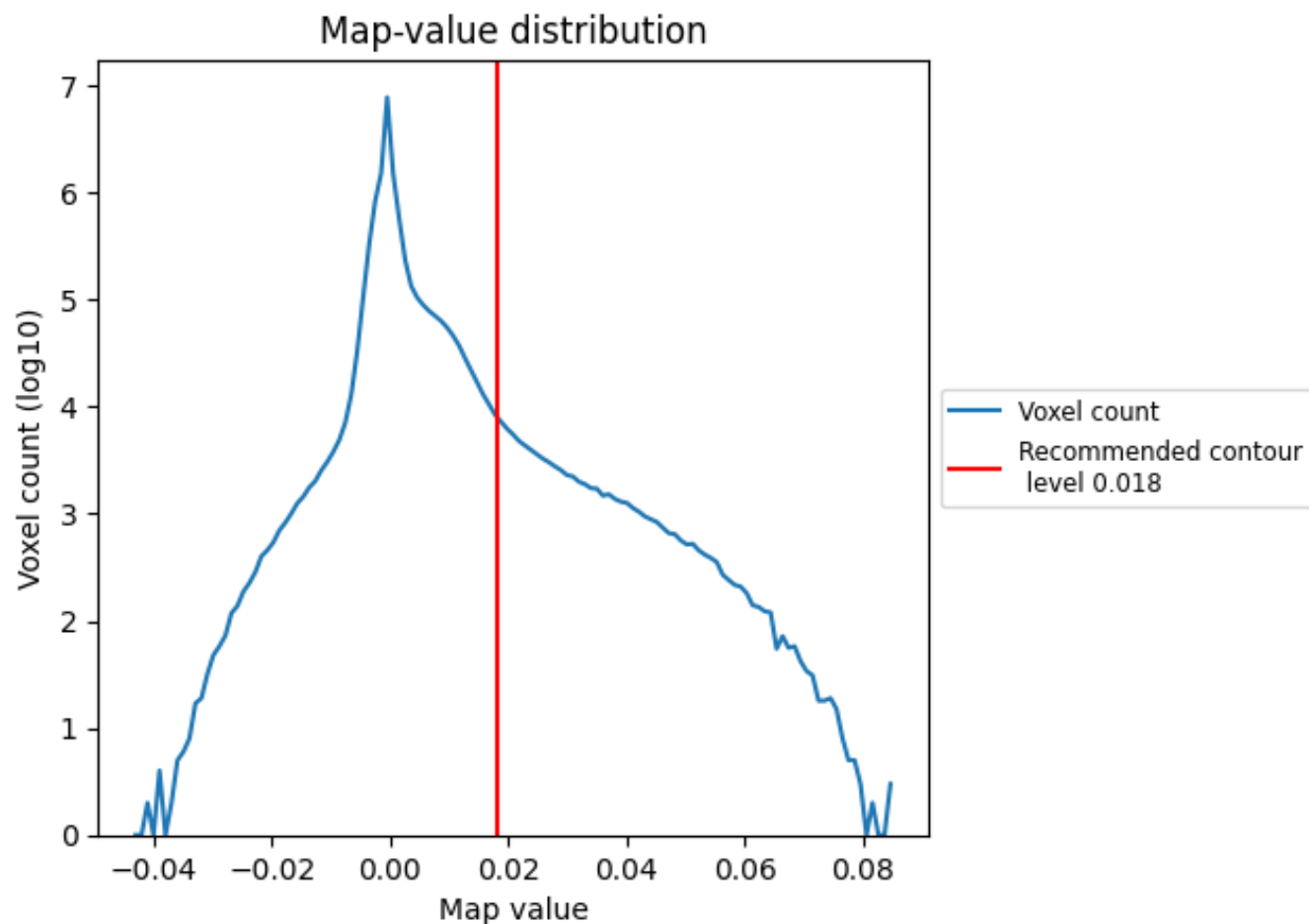
6.6 Mask visualisation [i](#)

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

7 Map analysis [i](#)

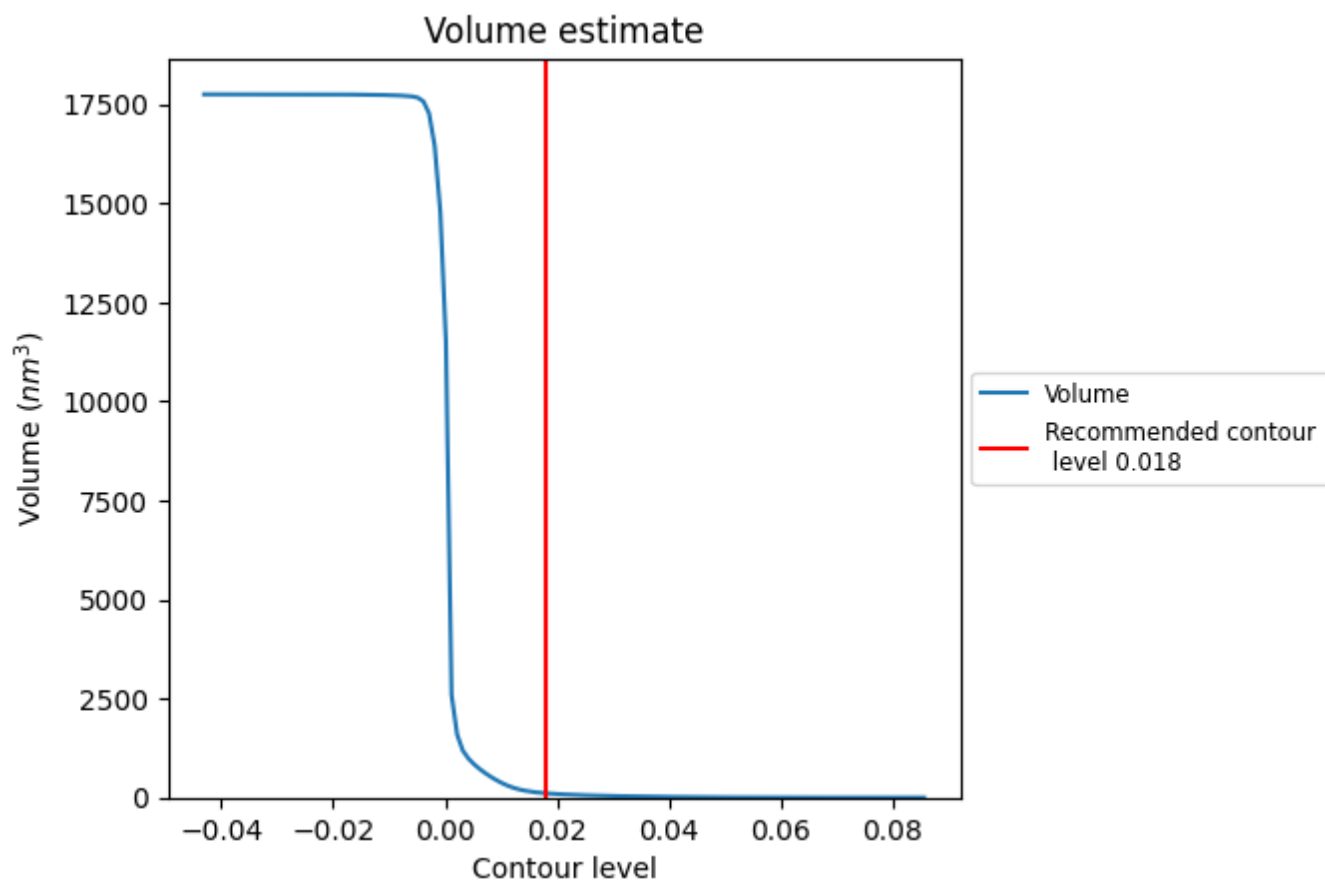
This section contains the results of statistical analysis of the map.

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.

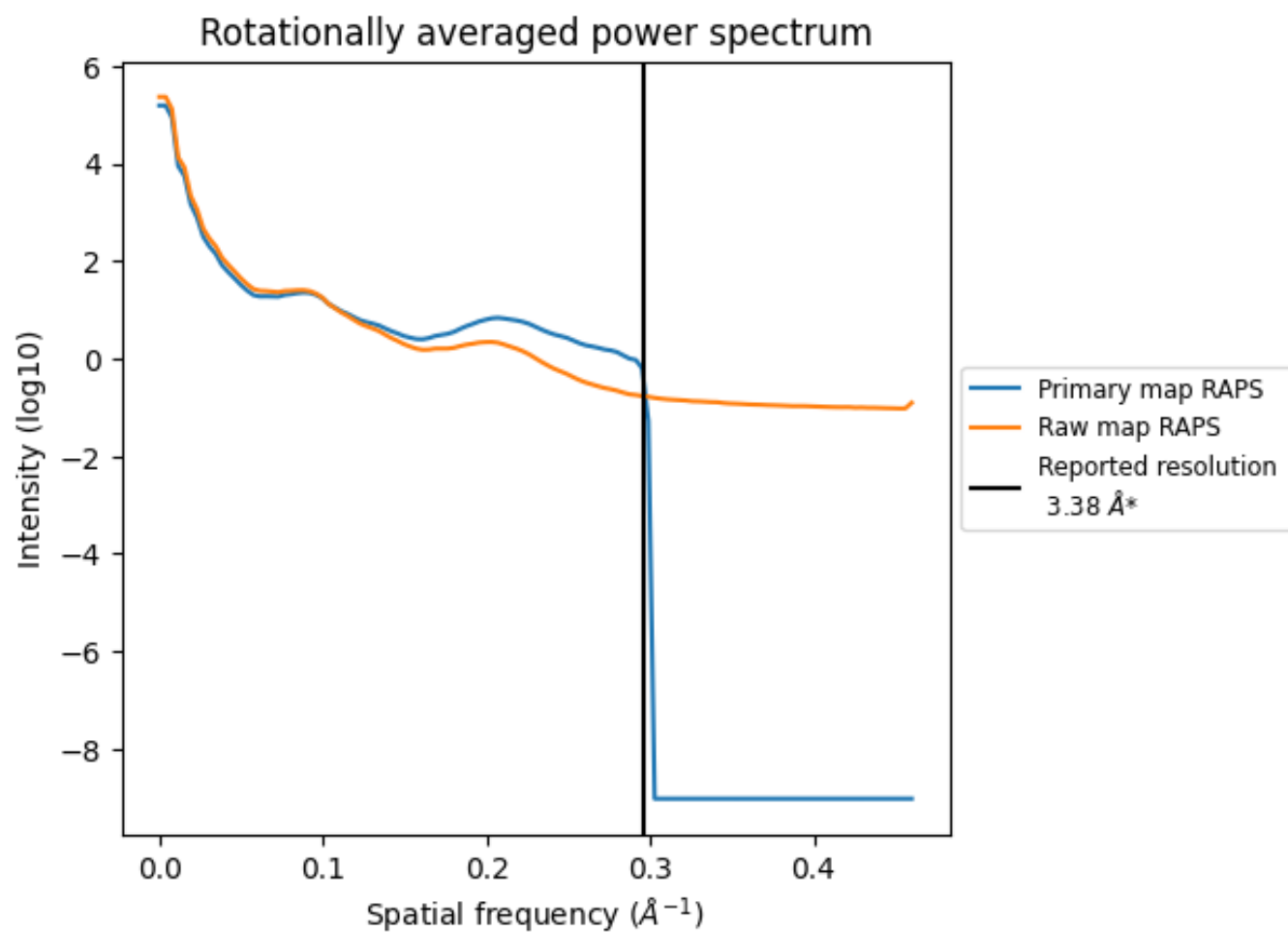
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 109 nm³; this corresponds to an approximate mass of 98 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 ⓘ

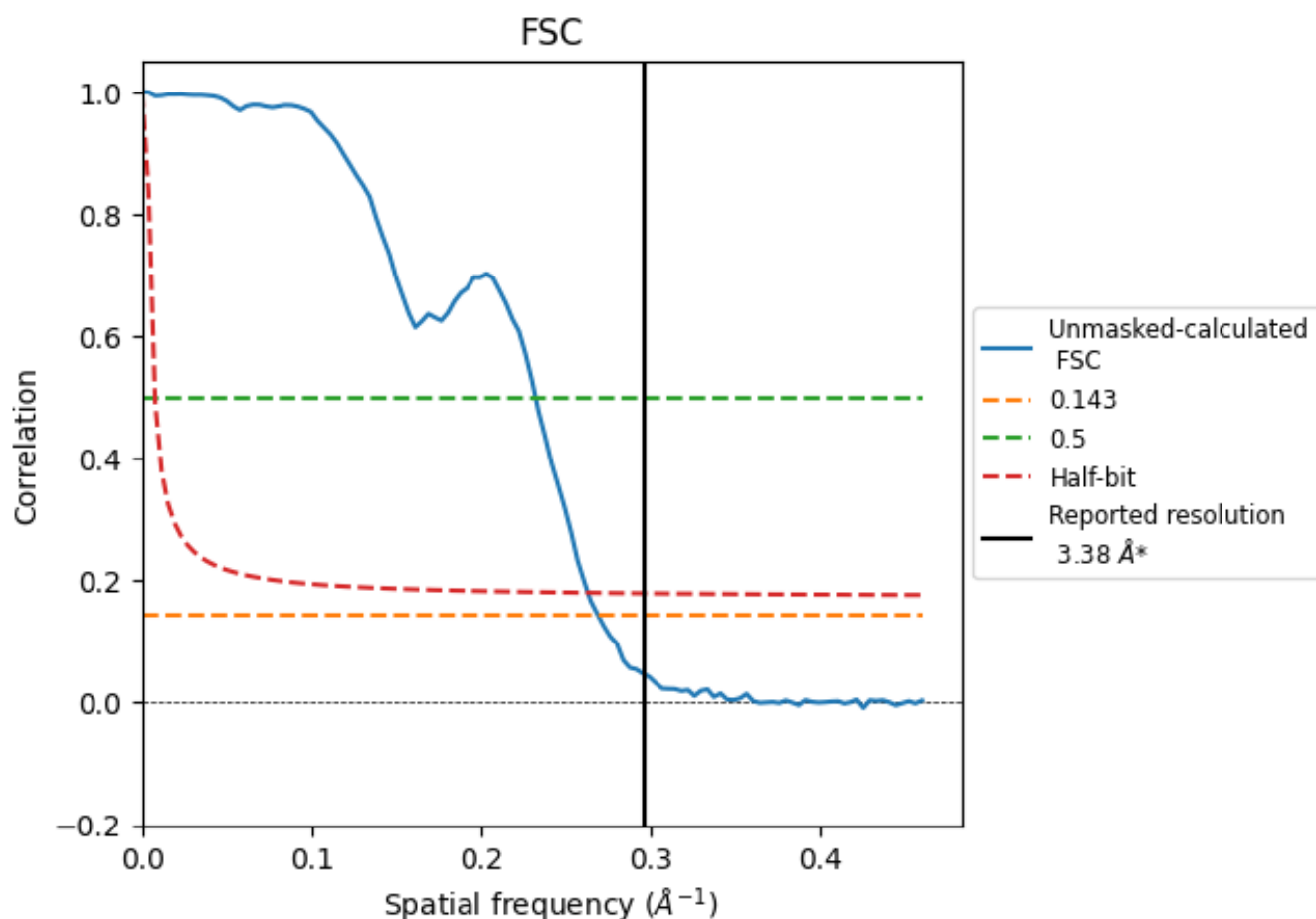


*Reported resolution corresponds to spatial frequency of 0.296 Å⁻¹

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 0.296 $\text{\AA}^{-1}$

8.2 Resolution estimates [i](#)

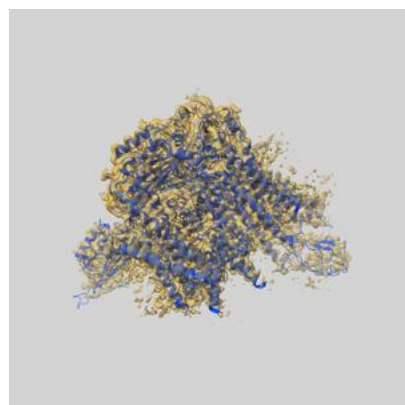
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.38	-	-
Author-provided FSC curve	-	-	-
Unmasked-calculated*	3.72	4.31	3.81

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 3.72 differs from the reported value 3.38 by more than 10 %

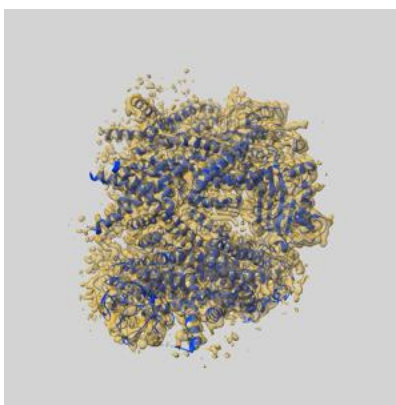
9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-60222 and PDB model 8ZL8. Per-residue inclusion information can be found in [section 3](#) on [page 9](#).

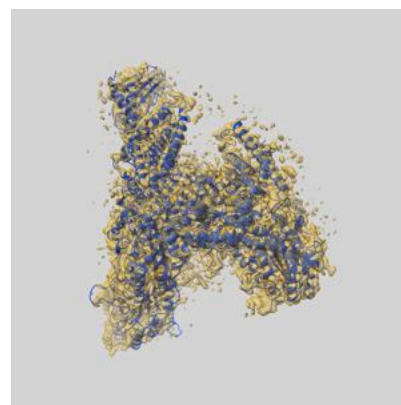
9.1 Map-model overlay [i](#)



X



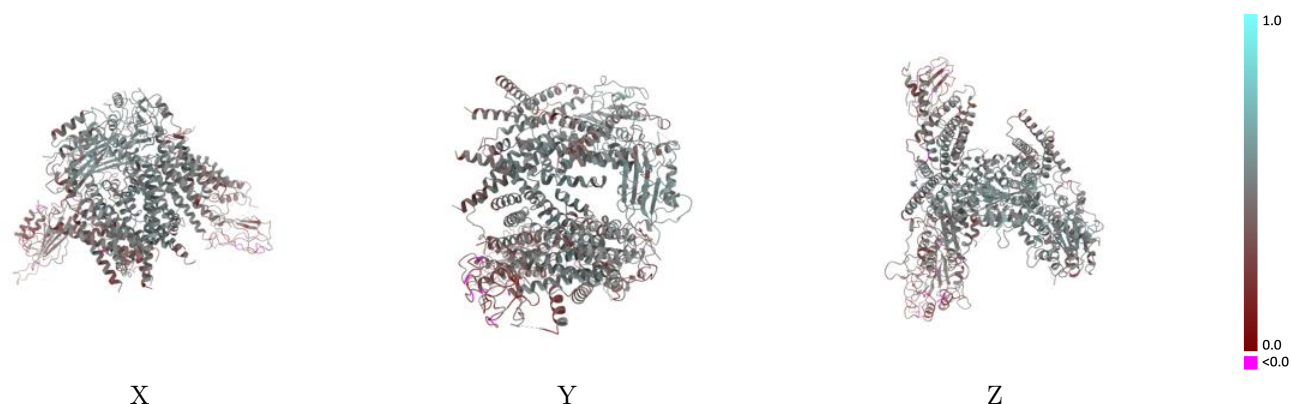
Y



Z

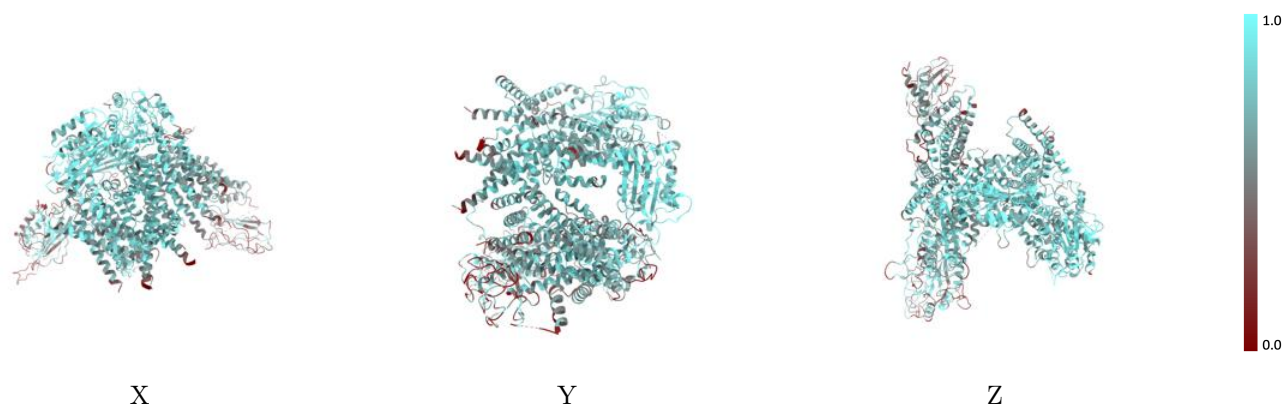
The images above show the 3D surface view of the map at the recommended contour level 0.018 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



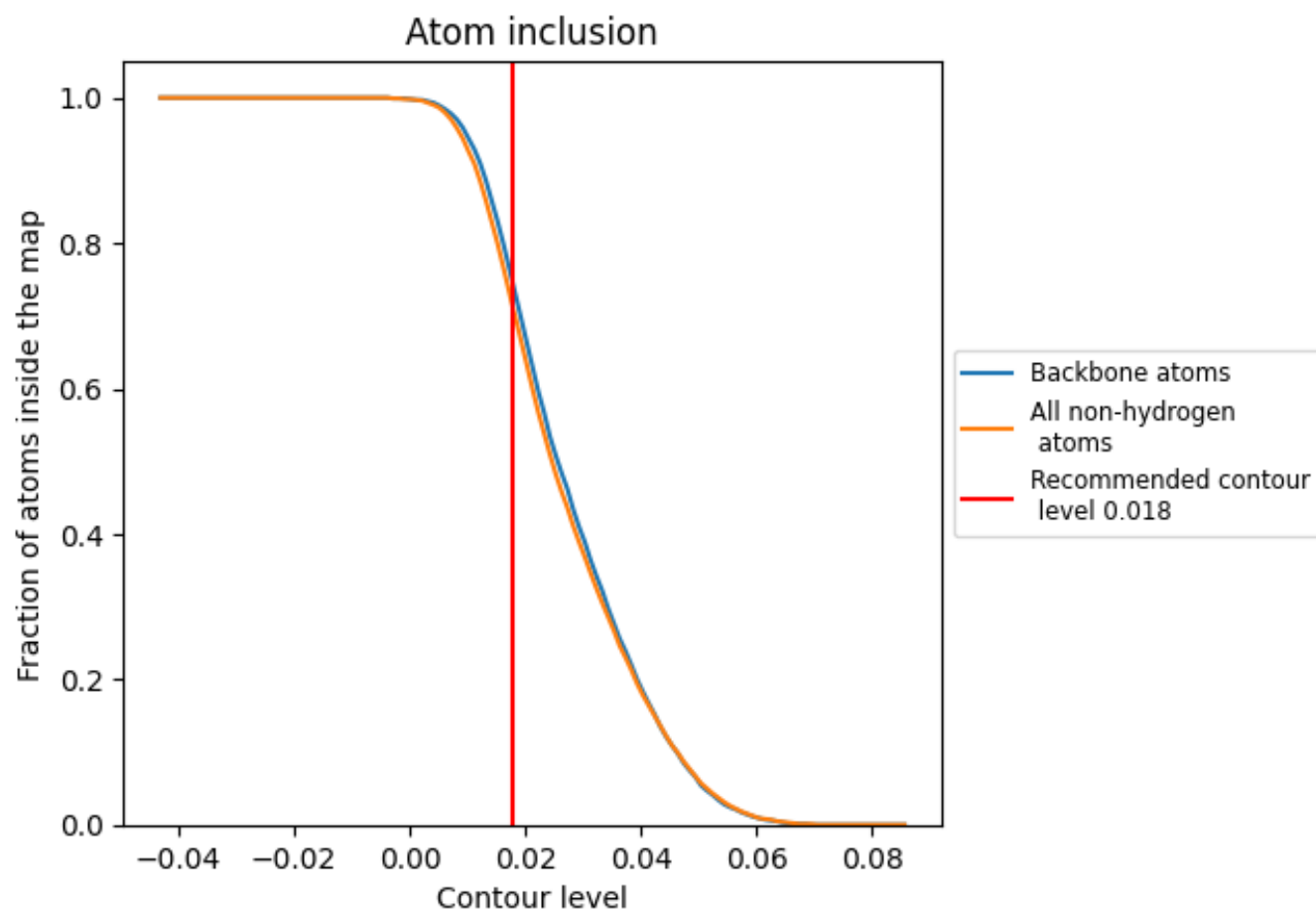
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions 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 (0.018).

9.4 Atom inclusion [i](#)



At the recommended contour level, 74% of all backbone atoms, 71% 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 (0.018) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	0.7070	0.4500
A	0.6390	0.4310
B	0.7870	0.4970
C	0.7700	0.4780
D	0.6690	0.3910

