JOURNAL OF SYNCHROTRON RADIATION

Volume 24 (2017)

Supporting information for article:

Comparison of helical scan and standard rotation methods in single-crystal X-ray data collection strategies

Ivan Polsinelli, Martin Savko, Cecile Rouanet-Mehouas, Lidia Ciccone, Susanna Nencetti, Elisabetta Orlandini, Enrico A. Stura and William Shepard

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Figure S1 Crystal snapshots describing where the helical *HS* and standard *STD* rotation experiments were carried out on each transthyretin (TTR) crystal. Plots of the quality metrics: R_{obs}, R_{meas}, $\langle I/\sigma_I \rangle$, $CC_{½}$, CC_{ano}, σ_{ano} for each data set are provided to compare the various data sets.

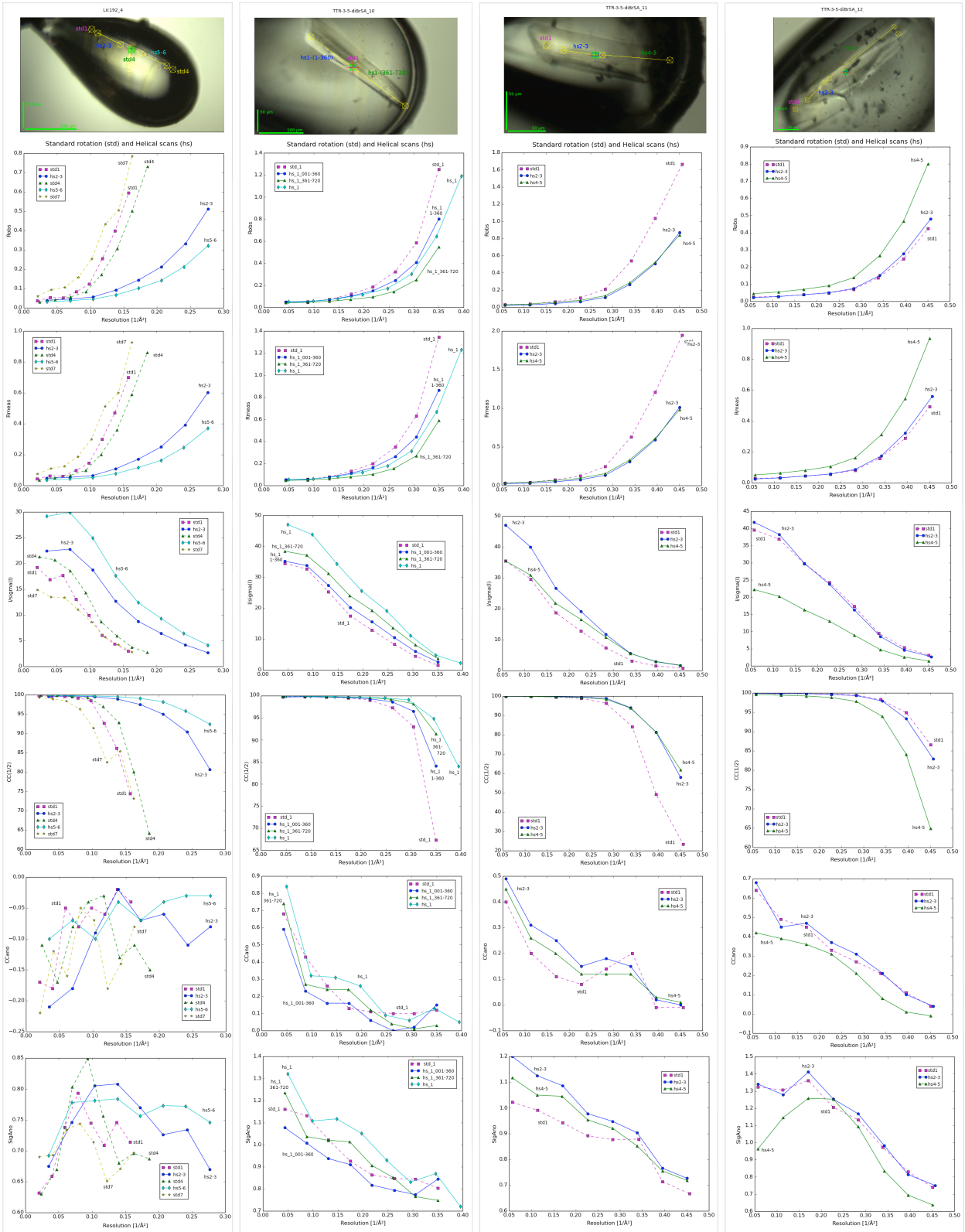
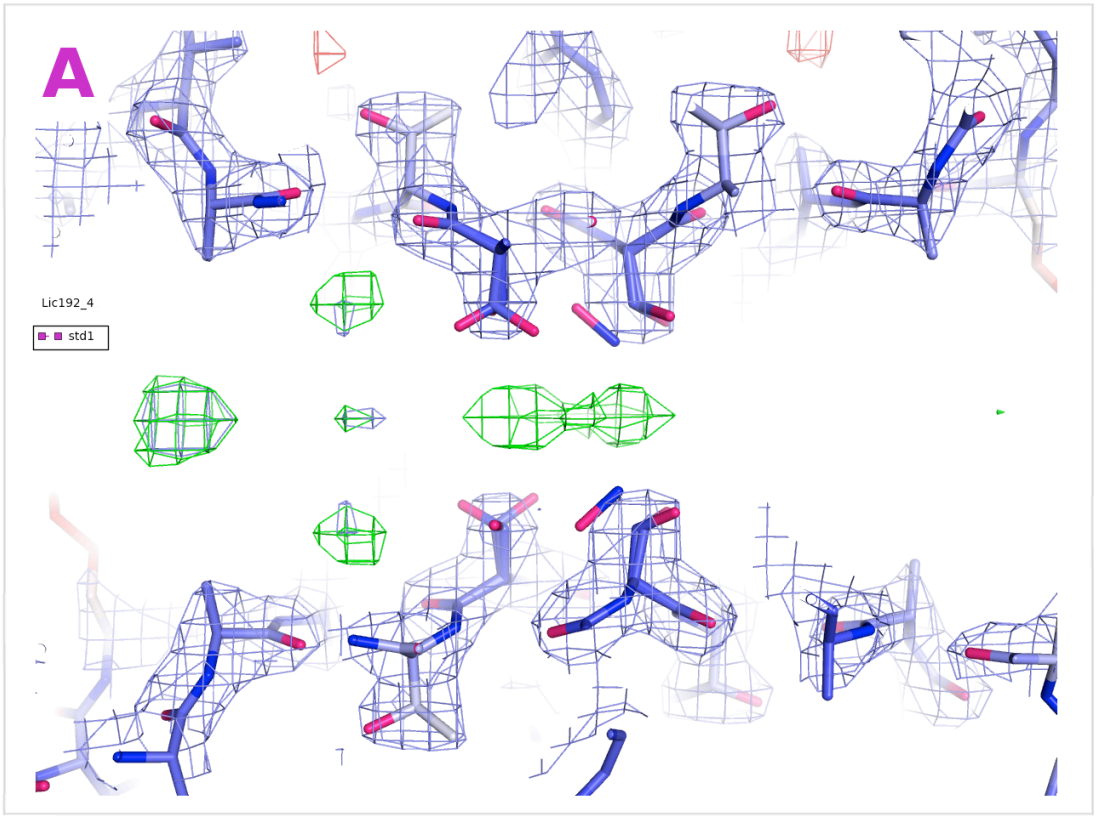


Figure S2 Electron density, weighted 2Fo-Fc and Fo-Fc for Lic192_4 (statistics: Figure S1 column 1) without ligand fitted. **A** Map obtained using data from *std1* data set. **B** Map obtained using data from *hs2-3* data set. The map obtained for the helical data collection appears to be qualitatively more informative.



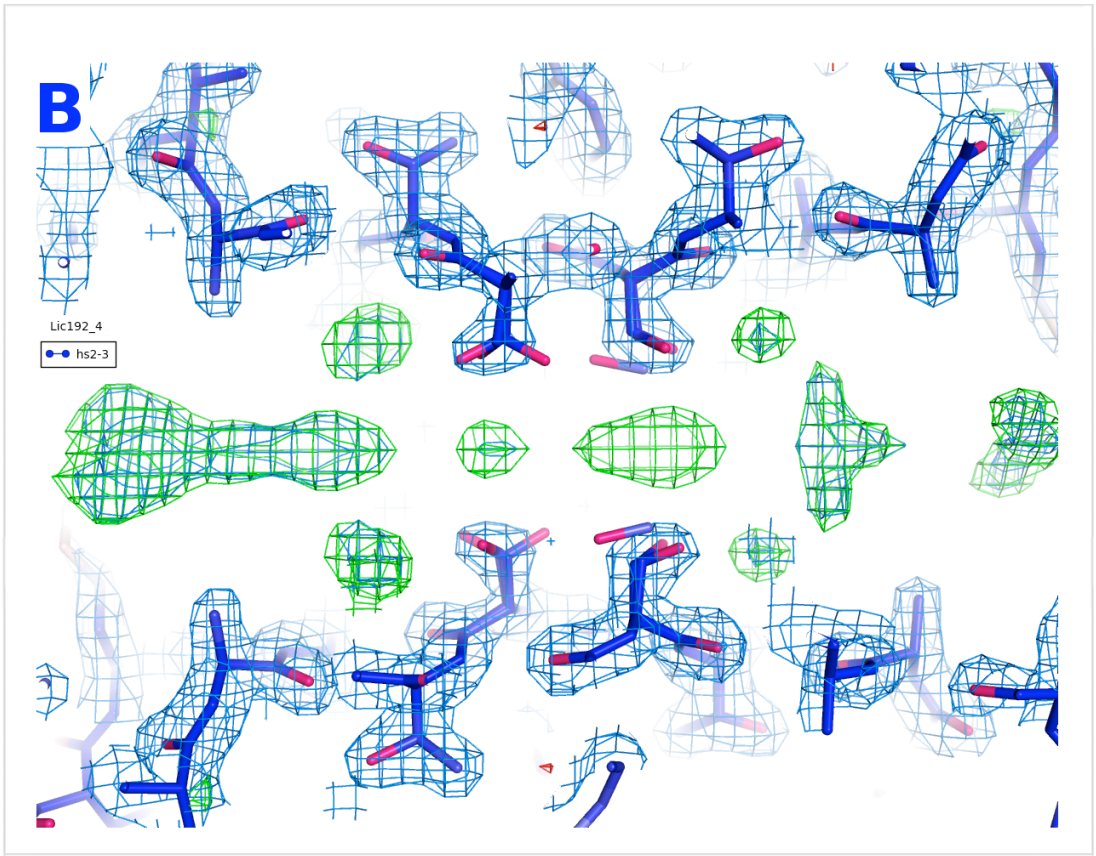
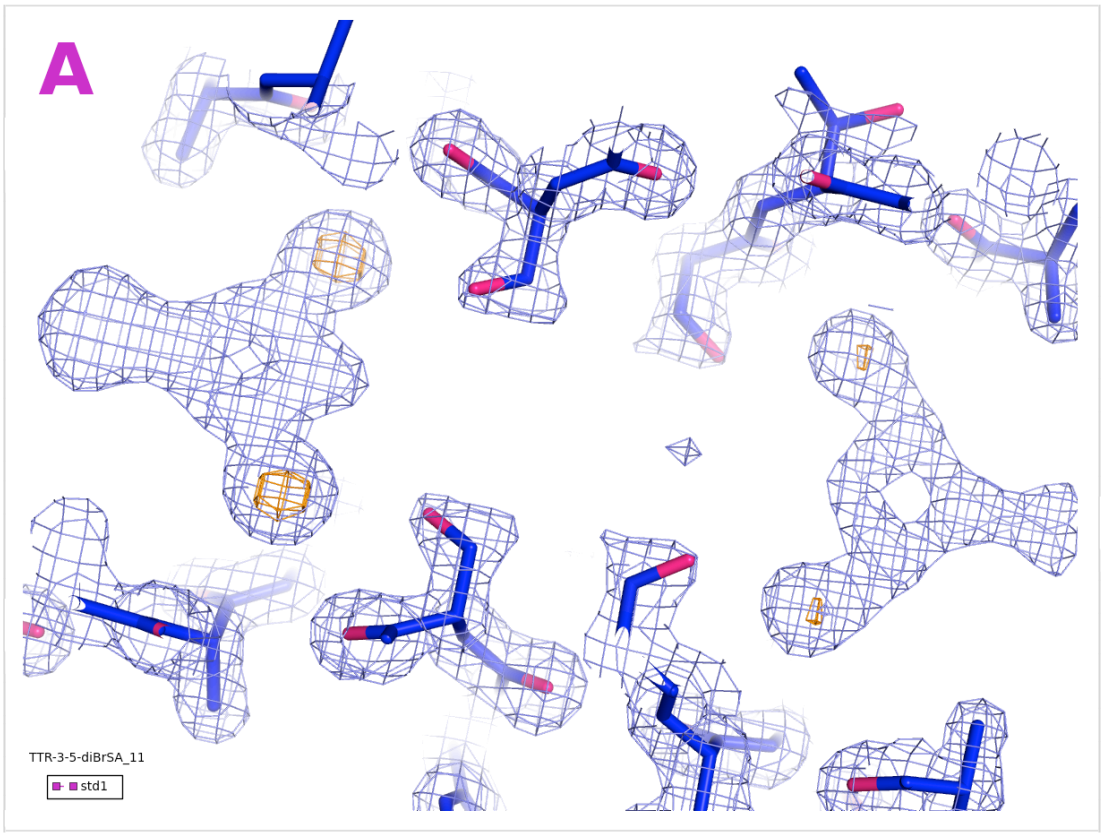


Figure S3 Electron density, weighted 2Fo-Fc (blue) and anomalous signal (orange) for TTR-3-5-diBrSA_11 using phases from the molecular replacement (statistics: Figure S1 column 3) without ligand fitted. **A** Map obtained using data from *std1* data set. **B** Map obtained using data from *hs2-3* data set. The maps appear to be of similar quality. However the *std1* data did not allow phasing of the structure (see Figure 3).



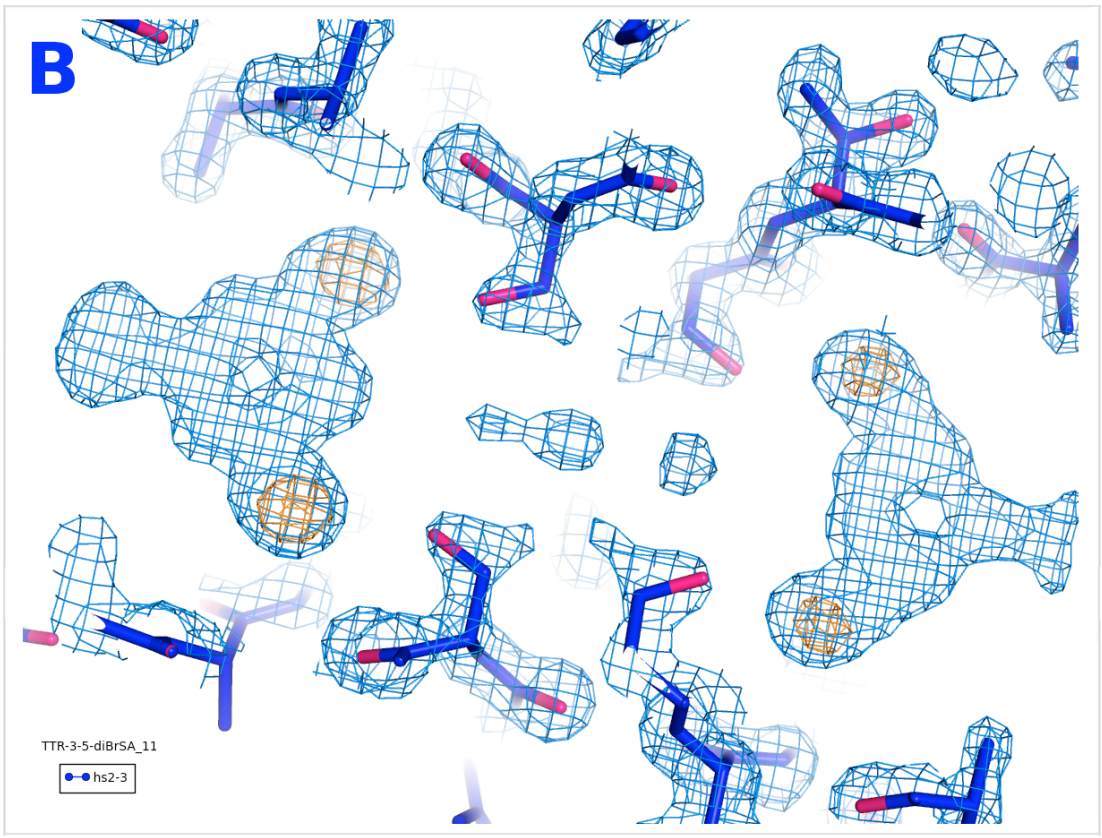


Figure S4 Crystal snapshots describing where the helical *HS* and standard *STD* rotation experiments were carried out on each zinc metalloprotease MMP-12 crystals. Plots of the quality metrics: R_{obs}, R_{meas}, $\langle I/\sigma_I \rangle$, $CC_{½}$, CC_{ano}, σ_{ano} for each data set are provided to compare the various data sets.

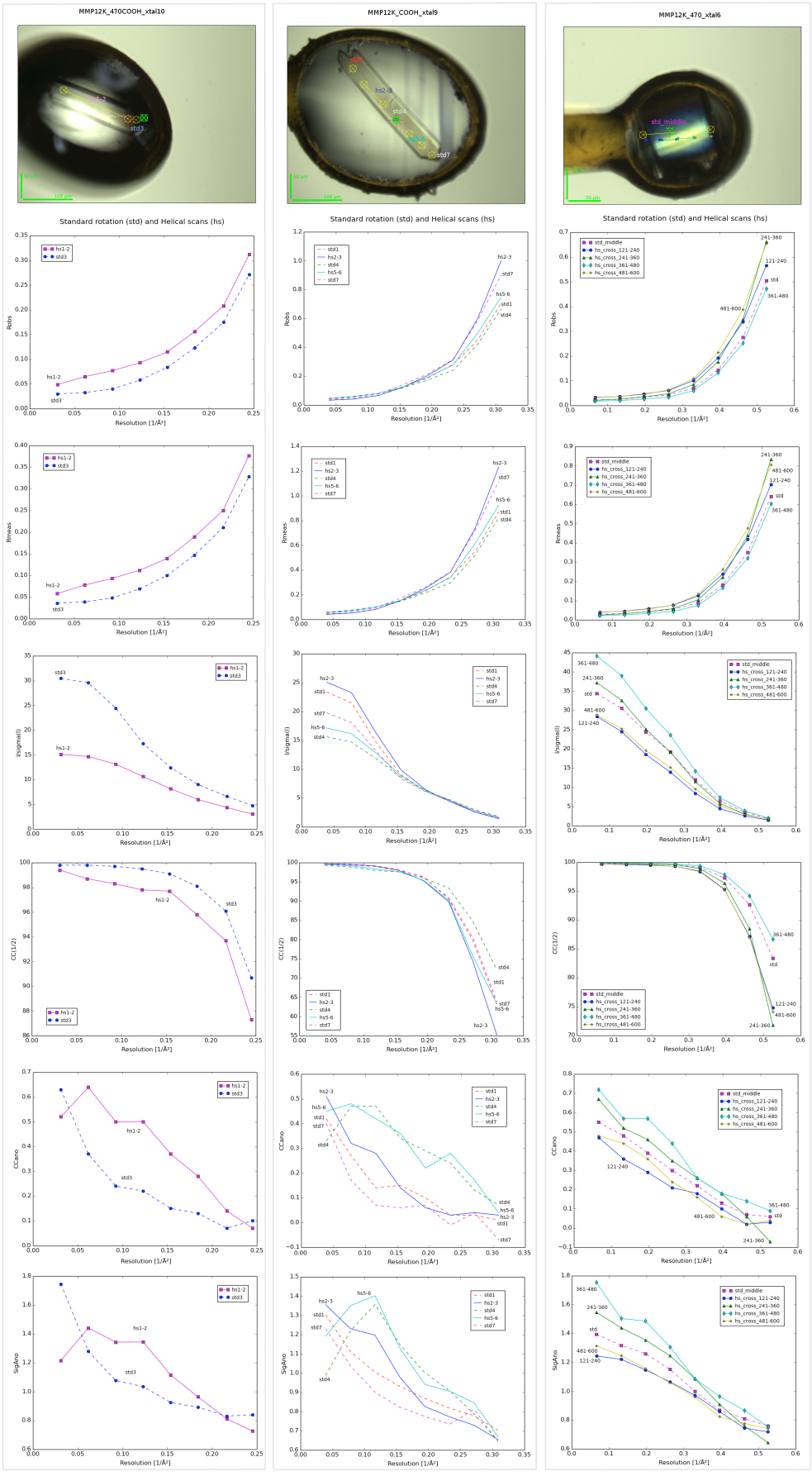
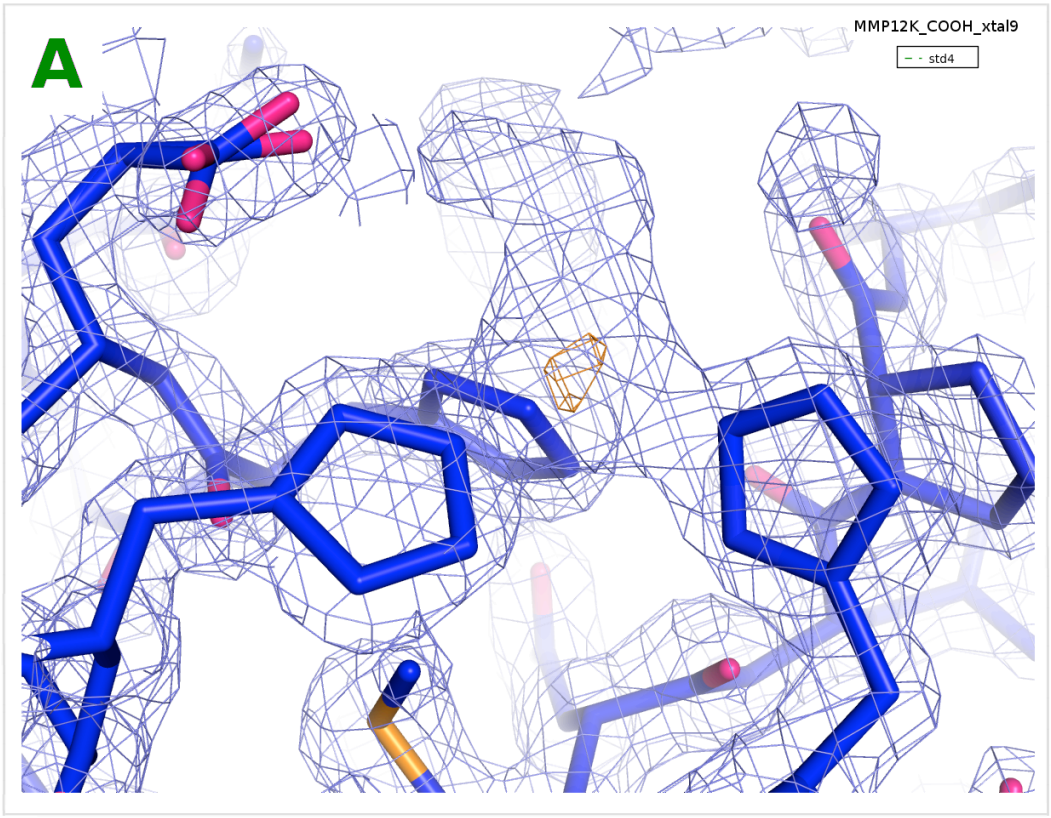


Figure S5 Electron density, weighted 2Fo-Fc (blue) and anomalous signal (orange) for MMP12 data using phases from the molecular replacement. (Figure S4 column 2) without ligand fitted. **A** Map obtained using data from *std4* data set. **B** Map obtained using data from *hs5-6* data set. The maps are of similar quality, probably because the crystals were large prisms over five times the beam size. The anomalous signal for the zinc atom (not shown) from the helical data is marginally stronger.



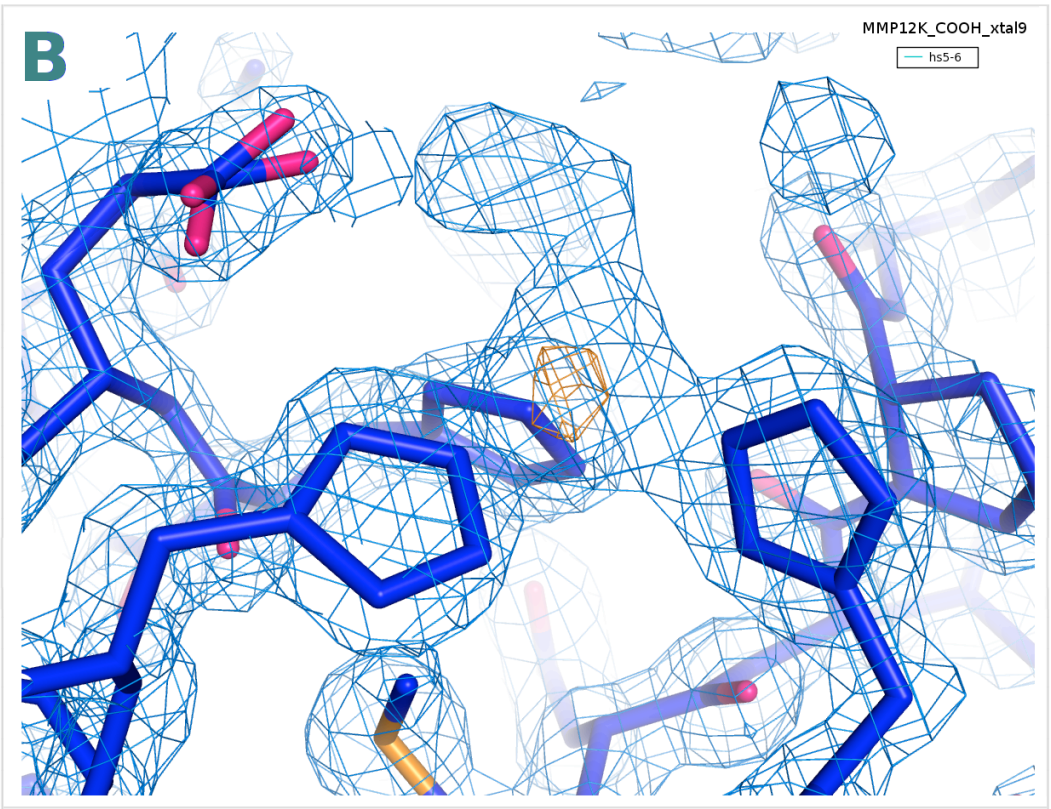


Table S1 Crystallographic details for MalM data collection (see also Figure S6 column 2). Crystal dimensions 10 × 10 × 246 µm, Data collection parameters: temperature 100 K, X-ray wavelength 0.97896 Å, 1.0 s exposure per image, 50 images, 2.0° oscillation range, total angular sweep 100°. The diffraction data were deliberately cut-off at 6Å resolution. Values in parentheses are for the outer resolution shell.

Data collection mode (acronym)	**Helical (hs2-3)**	**Standard (std4)**	**Helical (hs5-6)***
Space group	$P4_12_12$ or $P4_32_12$	$P4_12_12$ or $P4_32_12$	$P4_12_12$ or $P4_32_12$
Unit-cell parameters [Å]			
a	102.27	101.42	101.48
b	102.27	101.42	101.48
c	384.05	380.42	380.62
Wavelength [Å]	0.97896	0.97896	0.97896
X-ray Flux [ph/s]	2.5×10^{11}	2.5×10^{11}	8.0×10^{11}
Helical scan pace	96 µm/100°	-	75 µm/100°
Resolution range (Outer shell) [Å]	47.92 - 5.99 (6.35 - 5.99)	47.55 – 5.98 (6.33 - 5.98)	49.0 – 6.00 (6.36 – 6.00)
Total No. reflections	39966 (6259)	40158 (6121)	39706 (6263)
No. unique reflections	5458 (825)	5491 (813)	5350 (821)
Completeness	99.4% (98.4%)	99.3% (98.0%)	97.6% (98.1%)
Multiplicity	6.39 (7.59)	7.31 (7.53)	7.42 (7.63)
$\langle I/\sigma_I \rangle$	8.02 (2.57)	3.35 (0.93)	7.02 (2.01)
R_{meas}	28.5% (112.5%)	81.2% (426.5%)	31.6% (143.4%)
$CC_{1/2}$	99.4% (75.3%)	98.6% (98.6%)	99.0% (65.0%)
CC_{ano}	14% (5%)	-3% (-4%)	8% (0%)
σ_{ano}	0.884 (0.717)	0.708 (0.607)	0.823 (0.708)
RADDOSE results			
Average Diffraction Weighted Dose [MGy]	8.55	42.70	32.92
Elastic Yield [photons]	4.59×10^{9}	4.59×10^{9}	1.47×10^{10}
Diffraction Efficiency (photons/MGy)	5.37×10^{8}	1.08×10^{8}	4.46×10^{8}
Average Dose (Exposed Region) [MGy]	8.05	32.99	30.87
Maximum Dose [MGy]	19.205	176.693	78.670
Dose Contrast	1.61	2.87	1.65
Used Volume	51.6%	12.6%	43.1%

** The data set hs5-6 was collected over a different part of reciprocal space.*

Figure S6 Crystal snapshots describing where the helical *HS* and standard *STD* rotation experiments were carried out on MalM crystals. Plots of the quality metrics: R_{obs}, R_{meas}, $\langle I/\sigma_I \rangle$, $CC_{½}$, CC_{ano}, σ_{ano} for each data set are provided to compare the various data sets.