Supplementary Material

1 SUPPLEMENTARY TABLES AND FIGURES

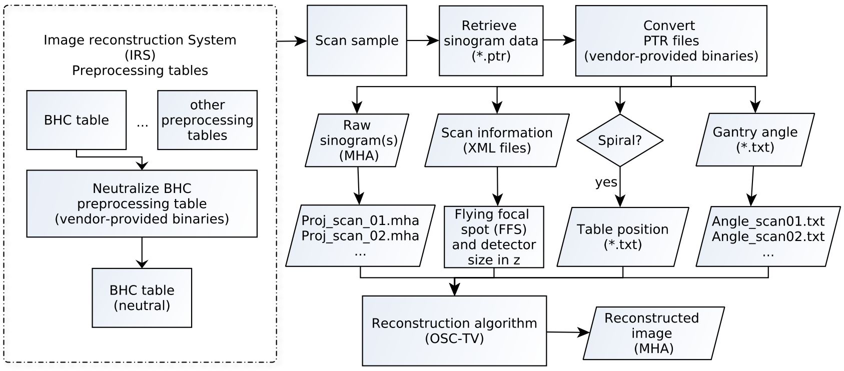

Figure S1. Reconstruction software flowchart using vendor-provided binaries and an in-house reconstruction algorithm.

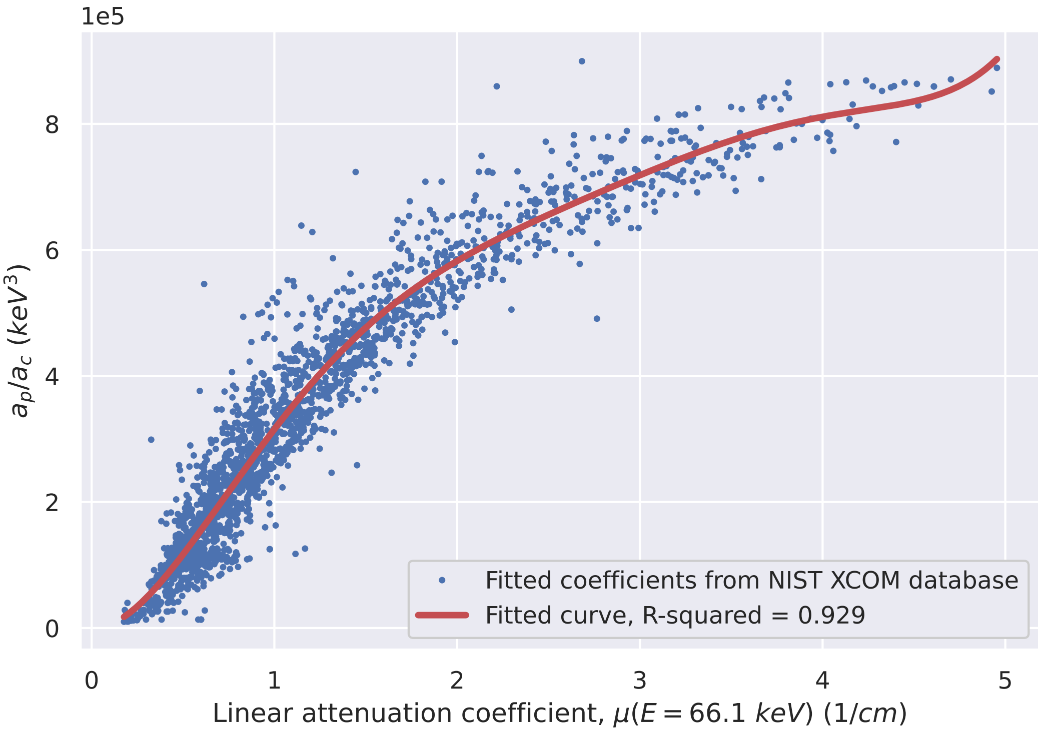

Figure S2. Calibration curve used in the OSC-TV-poly algorithm, which estimates ap/ac from uncorrected linear attenuation coefficient. The pairs ap/ac represent the photoelectric, and Compton coefficients, and were calculated in the work of Trotta et al. 2022 [1], which were based on a large list of materials compiled by Bathelmy [2]. More than 3,000 materials are used, constrained by the effective atomic number Zeff $\leq$ 27, and the density $\rho \leq 5.2$ g/cm3. Elements that present K-edges in the 20 to 140 keV energy range are not considered. The correspondent linear attenuation coefficients are evaluated at the effective energy of the 100 kVp beam (E0=66.1 keV).

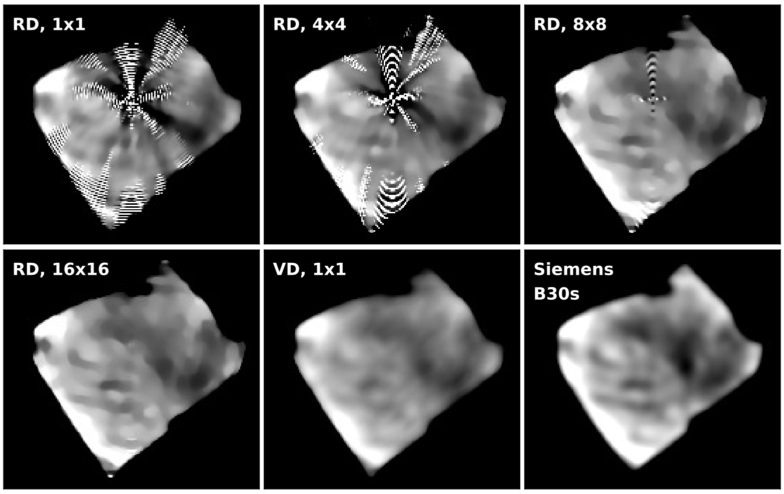

Figure S3. Chalcopyrite scanned at 140 kVp, reconstructions performed using OSC-TV and different approaches for forward- and backprojection: ray-driven with different number of rays per detector bin (*e.g.* 1x1, 4x4, etc.), voxel-driven (1 ray per voxel, 1x1), and the reconstruction provided by Siemens using the kernel B30s. Window [1.1:1.6] cm^{-1}.

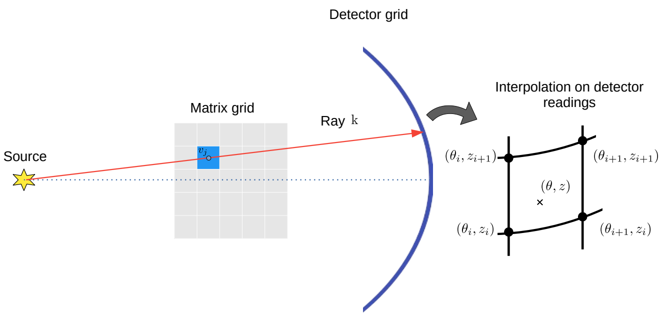

Figure S4. Voxel-driven backprojection with bilinear interpolation. Center of voxel v_j is projected onto the detector, where interpolation on adjacent detector readings takes place.

Table S1. Calibration values for the Siemens water phantom. Mean attenuation values (1/cm) are shown for preprocessed and neutral projections.

Water phantom	Linear atteunation coefficient, μ (cm^{-1})		
	Preprocessed	Neutral	Tabulated from NIST XCOM at E_{eff}
100 kVp	0.192	0.199	0.197 (66.1 keV)
140 kVp	0.192	0.184	0.181 (83 keV)

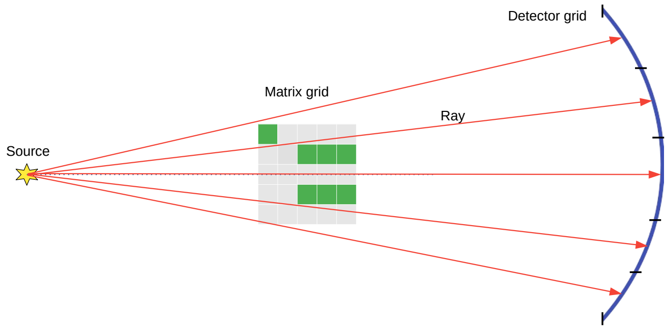

Figure S5. Ray-driven backprojection. Depiction of several rays going from source to center of detector element, intercepting voxels. Some voxels are poorly intercepted or not intercepted at all.