

Measuring Interstellar Grains from the Haloes
of Binary X-ray Sources

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Coherent forward scattering of X-rays by interstellar grains creates a halo around the X-ray image of a compact source. The fractional halo brightness at 2 keV is typically of order 10% for moderately reddened galactic sources. The angular brightness distribution of the halo, which extends over several arcminutes, indicates the size distribution of the grains, and the spectrum of the halo indicates the composition of the grains. The halo will persist for several hours after the point source vanishes during an eclipse of a binary source; this provides a way to avoid systematic errors in measuring halo brightness due to an extended point response function of the X-ray telescope. Indeed, it is possible to infer the size distribution and composition of the grains without an imaging X-ray telescope by observing the time-dependence of the halo spectrum during eclipse.