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## PSF: Point Spread Function

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Describes the shape of the image produced by a delta function (point) source on the detector. Also known as "Point Response Function" (PRF), information on the size and shape of the PSFs is stored in the [PSF Library](#).

Chandra produces sharper images than any other X-ray telescope to date and therefore provides an opportunity for high-angular and spectral resolution studies of X-ray sources. Crucial to these studies is the knowledge of the characteristics of the PSF. The blurring of the Chandra PSF is introduced by the [HRMA](#) PSF, the [aspect](#), the limited size of detector pixels and detector effects.

Simulating the HRMA PSF using ChaRT is the first step in obtaining a good model of the Chandra PSF for a given observation. The shape and size of the HRMA PSFs vary significantly with source location in the telescope field of view (FOV), as well as with the spectral energy distribution of the source. Because of the Wolter Type I design, the image quality is best in a small area centered about the optical axis. In fact, the mirrors were designed to produce images with better than one arc-second resolution; in particular to concentrate better than 85% of the energy at 0.277 keV within a 1 arcsec diameter (see the [Proposers' Observatory Guide](#)).

A substantial pre-launch effort was directed at creating a faithful model of the HRMA mirror and its mechanical and optical systems (Jerius et al. 2000, [compressed postscript format](#)), also see the [ChaRT References section](#). The "tuning" and the calibration of the HRMA PSF using in-flight data is an ongoing process (see the [HRMA calibration](#) and [ChaRT caveats](#) pages).

It is important to note that currently the Chandra on-axis PSF is dominated by the detector blurring effects due to the limited size detector pixels, residual detector introduced artifacts including pileup (see [ChaRT caveats](#)).

Please see the [PSF library caveats](#), the [mkpsf](#) ahelp file, and the [HRMA PSF](#) page.

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