M31b Point Spread Function of the Yohkoh Soft X-Ray Telescope

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For the purpose of using the observed *Yohkoh* Soft X-Ray Telescope (SXT) images in both morphological and photometric studies, it is necessary to subtract the blurred component by scattering and to regularize the noise inherent in the image. In order to perform the restoration of an observed image, we need to know detailed information on the shape of the point spread function (PSF). Ground experiments were carried out for the determination of the SXT PSF (Martens *et al.* 1995). However, the details of the characteristics of the PSF could not be evaluated from their analysis. For instance, the PSFs they obtained at the same location on the CCD showed quite different results, which means that they could not analyze the data in an appropriate way. As a result, it was unable to measure the radial variation from the optical axis nor the wavelength dependence of the PSF precisely. We have found from simulation that with the method of analysis they used it is difficult to find a reasonable best-fit solution. For example, the undersampling effect in the experimental data, which Martens *et al.* (1995) did not consider in their analysis, is revealed very serious. It is especially so at the peak of the PSF, since the full width at half maximum of the PSF is only about one pixel size. Furthermore, based on the theoretical point of view, the SXT PSF should have been described by the synthesized model of the convolution of the Gaussian component with the functional form of the differential scattered intensity derived from first-order vector perturbation theory (Shin 1998). In this study we re-evaluate the ground experimental data and discuss the results of reproduction of the best-fit PSFs using our model distribution. A successful reproduction of the shape will hopefully enable us to find detailed characteristics of the PSF.