

[ID27] Source Detection for Chandra ACIS Observations

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High spatial resolution Chandra X-ray observation has been resolved many point sources in both galaxies and clusters of galaxies. The observed brightness and spatial distribution of points sources however suffer from the incomplete detection and inaccurate count recovery. These incompleteness are due to the limit of the capability of a digital photometry software and depend strongly on background counts, brightness and location of source on X-ray image. We investigate the variation of detection incompleteness by performing a large number of artificial source experiments for the Chandra ACIS observations. To carry out these numerical simulations we developed X-ray photometry softwares called XFAKE and XPROCES. Both softwares are specifically intended for reduction of Chandra ACIS observation (source detection and extraction of source properties). The detection probability is found to decrease with increasing off-axis angle (OAA), an angle measured from on-axis to the position of a source on the focal plane and with decreasing source brightness. With slight dependency on varying background, the detection probability of point sources with net count > 10 and OAA < 5 arcmin is found to be greater than 95%. We describe the simulation softwares and discuss the detection probability and the count recovery rate for different background environment in detail. We also discuss the contribution of incomplete source detection and inaccurate count recovery on source number counts for Chandra ACIS observations of galaxy clusters.
