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Coronal Differential Emission Measure Extraction Using EUV Images from the MSSTA Rocket

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The Multi-Spectral Solar Telescope Array obtained simultaneous images of the solar corona in 5 extreme-ultraviolet bandpasses (centered at 150, 171, 180, 195 and 211 Å) and 2 far-ultraviolet bandpasses (centered at 1216 Å and 1550 Å), with spatial resolution ranging from 1-20 arcseconds. Using these data, we construct spatially-resolved differential emission measure functions which represent complete descriptions of the thermal state of coronal plasma within each observed pixel, and which successfully reproduce our observations. However, these results must be viewed with some caution, as they are (1) non-unique and (2) highly sensitive to error in observations and in assumed atomic and plasma properties. We systematically investigate the effect of different errors on our ability to invert EUV observations and measure the coronal DEM. The techniques and results of this investigation are applicable to future missions, including STEREO and SDO.