

**A Revolution in DEM Analysis with Application to Nanoflare Heating**

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Differential emission measure analysis is a technique commonly used with instruments that observe multiple spectral bands (e.g., SDO/AIA, Hinode/XRT and EIS) to solve for the temperature and emission measure of multithermal, optically thin coronal plasma along a line of sight. However, the inversion is ill-posed and frequently under-determined. Until now, all DEM methods have only attempted to solve single solution shapes (albeit with Monte Carlo sampling of the uncertainties sometimes) that reasonably satisfy constraints of positivity, regularization, fit to the data, and/or speed of calculation. A novel method is presented for the under-determined problem that identifies all of the global best-fit, positive solutions at a useful speed. We apply the method to investigate nanoflare heating to illustrate the range of high-temperature emission measure slopes that are compatible with the data.