

Abstract Submitted
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Deconvolution Map-Making for Cosmic Microwave Background Observations CHARMAINE ARMITAGE, BENJAMIN WANDELT, UIUC — We describe a new map-making code for cosmic microwave background (CMB) observations from scanning telescopes which removes artifacts due to beam asymmetries and far sidelobes. The deconvolution map-making method implements the fast algorithms for convolution and transpose convolution of two functions on the sphere [B. Wandelt and K. Górski, *Phys. Rev. D* **63**, 123003 (2001)]. Our approach is a generalization of existing CMB map-making techniques to solve the maximum likelihood map-making problem for arbitrary beam shapes. We test our algorithm on simulated time-ordered data for three beam models and two scanning patterns, including a coarsened version of the WMAP strategy. We quantitatively compare our results with a standard map-making method and demonstrate that the true sky is recovered with high accuracy via the deconvolution method. Deconvolution map-making recovers features of the CMB sky on the smallest scale of the beam, thereby achieving a form of super-resolution imaging.

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