
Full Resolution Faraday Synthesis

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Résumé

We introduce a new procedure for Faraday synthesis, which transforms around a central wavelength of 0, and restores cleaned spectra with the real beam. This method achieves a factor of at least 3 improvement in Faraday resolution for tomography mapping and for recognizing complexity in spectra, while producing identical results to standard Faraday synthesis for single delta-function spectra. We present simulations and examples showing the power of full resolution using MeerKAT data, including reconstruction of the 3D structure of radio galaxies in the absence of strong foreground RM fluctuations. We discuss the intrinsic indeterminacy of complexity parameters for structure on scales less than the resolution of standard spectra, and the open issues for general use of full resolution Faraday spectra.

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