Restoration of radio astronomical images: an Analysis by Synthesis Approach

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Résumé

The SKA with its bandwidth and its instantaneous field of view will be able to survey the sky at unprecedented sensitivity and resolution in a wide region of the radio band, thanks to the exploitation of massive computing, dedicated signal processing and innovative antenna design. Yet it will give rise to new challenges in data processing, in particular the ability of image restoration algorithms to recover faint and diffuse radio sources. In radio interferometric images, such sources are buried in the PSF sidelobes of surrounding bright compact sources, and the noise . We propose a sparsity promoting restoration model which is based on highly redundant, shift invariant dictionaries, and hybrid in its sparsity priors.

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