

Meeting: 1003, Atlanta, Georgia, SS 4A, AMS-SIAM Special Session on Theoretical and Computational Aspects of Inverse Problems, I

1003-65-1714 **Chrysoula Tsogka*** (tsogka@math.uchicago.edu), **George Papanicolaou** (papanicolaou@stanford.edu) and **Liliana Borcea** (borcea@caam.rice.edu). *Interferometric array imaging in clutter*. Preliminary report.

We consider the problem of array imaging in clutter. The clutter is modeled using an inhomogeneous index of refraction that is a stationary, isotropic, random process. To image we consider cross-correlations of the array data, the interferograms which are self-averaging. This is a key point to imaging in a regime with significant multipathing due to the interaction of the waves with clutter, as it is essential to have statistically stable functionals which give reliable results in spite of our uncertainty of the clutter. Because waves propagate through clutter the spatial and frequency coherence of the data received on the array depends on the random medium. We show how the resolution provided by interferometric imaging is related to these coherence parameters and not only to the physical aperture of the array and the available bandwidth. The efficiency and robustness of the proposed method in clutter will be illustrated with several numerical results. (Received October 12, 2004)