1027-35-194   **Fernando Guevara Vasquez*** (`guevara@math.stanford.edu`), Stanford Mathematics Dept., 450 Serra Mall Bldg. 380, Stanford, CA 94305, and **Liliana Borcea** (`borcea@caam.rice.edu`) and **George Papanicolaou** (`papanicolaou@stanford.edu`). *Selective illumination of extended targets in array imaging.* Preliminary report.

We present an algorithm that finds illuminations giving optimal images of extended targets with respect to an appropriate objective function measuring the quality of the image. Solving such optimization problem, specially in three dimensions, can be computationally expensive. An analysis in the Fraunhofer diffraction regime of the array response matrix in homogeneous medium allows us to greatly restrict the search to illuminations belonging to certain subspaces, which also allows to selectively illuminate the target. (Received February 26, 2007)