

Conference: Techniques and Instrumentation for Detection of Exo-Planets (AM123)

Title: Design and Fabrication of a Coherent Array of Single Mode Optical Fibers for the Nulling Coronagraph

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Abstract: The magnitude of starlight rejection needed to detect extra-solar planets with a nulling interferometer critically depends on the spatial filtering properties of the single mode optical fiber. In order to preserve spatial information in an imaging system for planet detection, the proposed visible nulling coronagraph requires an array of such fibers. We present the engineering constraints for fabrication of an array whose phase error is within the limits for imaging. We also discuss the alignment and fabrication tolerances needed to produce arrays of up to 1000 elements, and present the measurement results from subscale devices on the wavefront fidelity after filtering by the array.