Null Diversity for Coronagraphy

Description

This is a comprehensive suite of modeling tools which models visible nulling coronagraphs and interferometers with all known sources of error, and faithfully reproduces the performance as measured in the lab. The modeling suite allows for general beam propagation through visible nulling coronagraphs and interferometers and includes the effects of each optical surface, including amplitude, phase and polarization. It accurately models deformable mirrors, both continuous and segmented, coherent fiber bundles, achromatic phase shifters, optical misalignment and deformations, spectral bandpass, and detector effects such as sampling, quantization, pixel MTF, noise, and nonlinearities.

Features and Benefits

- Allows sensing down to optical systems fundamental physical limits
- The algorithm is fast and robust and has been coded and tested via simulation
- It operates over the range of 50 nanometers rms down to < 100 picometers rms in closed-loop
- The fast closed loop control times allowed by this approach makes more science targets available per year since less time is spent in waiting for a telescope system to settle and stabilize

Applications

- Coronagraphy
- Interferometry
- Simulation of High Precision Optical Systems
- Lithography
- Microscopy
- Medical Imaging

For More Information

If you are interested in more information or want to pursue transfer of this technology, GSC-16195-1, please contact:

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To view Goddard's entire portfolio of wavefront sensing technologies, please visit:
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