wavefront sensing portfolio

James Webb Space Telescope (JWST) Wavefront Sensing Software

Description

This software package is designed to determine the optical wavefront for the James Webb Space Telescope, but it is also applicable to other segmented telescope systems. At its core, it is a novel implementation of the Hybrid Diversity Algorithm (HDA), an image-based phase retrieval algorithm. The software can determine optical wavefront information based upon multiple irradiance measurements and the geometrical definition of the telescope's exit pupil. The software also can simulate data during development, as well as process actual data during test and operation.

Features and Benefits

- This software cuts processor run-time by 50% compared to previous implementations of the HDA.
- By implementing the most processor-intensive steps of the algorithm on specialized data signal processors, run-time has been decreased by more than a factor of 100.
- It uses orthogonal sub-sets along with the HDA, yielding increases in wavefront recovery accuracy.
- The software can divide the data from the primary telescope mirror across the mirror segments, which is essential for sensing and generating segment level aberrations and for controlling the segments.
- The software package is useful for both data simulation during development and data processing during test and evaluation.

Applications

This tool is applicable to control systems and R&D testing for segmented mirror systems and system operation methods.

For More Information

If you are interested in more information or want to pursue transfer of this technology, GSC-15399-1, please contact:

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