The Challenges of Coronagraphy with the James Webb Space Telescope

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Points of Concern for JWST Coronagraphy

• A good, stable PSF is critically important for many types of science envisioned with JWST, including coronagraphy.

• Requirements on image quality exist at a high level
  – Govern diffraction limit of JWST, change in encircled energy, and wavefront error (WFE) over the FOV (OBS-1607, OBS-88, OBS-90, OBS-1599)

• Wavefront sensing and control (WFS&C) will enable correction of misalignments in the primary mirror segments and secondary mirror.
  – will ensure that the PSF never exceed the requirement of 131 nm RMS WFE over the Optical Telescope Element (OTE) field of view (FOV).

• JWST pointing requirements specify a 5 mas (1 σ per axis) RMS pointing accuracy
  – challenge to know precisely where PSF is behind coronagraphic mask