
Assessing Starshade Technology Readiness

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Towards Starlight Suppression for the Habitable Worlds
Observatory Workshop
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Starshade Maturity with Respect to Habitable Worlds Observatory



- ExEP convened an independent board to assess the readiness of three starshade technologies with respect to the Habitable Worlds Observatory
 1. optical performance
 2. petal edges
 3. formation-flying sensing
- Starshade team presented an analysis of the maturity of the three technologies with respect to TRL 5 guidelines and assumed HWO requirements/environments
-> all technologies apply to HWO
- The ExEP is collating board feedback into a written report (nearly complete)

Board Membership:

- Matt Bolcar (NASA/GSFC)
- Simone d'Amico (Stanford)
- Opher Ganel (NASA/GSFC)
- Tupper Hyde (NASA/GSFC)
- Steve Kendrick (aerospace consultant)
- David Miller (NASA/JPL)
- Omid Noroozian (NASA HQ)
- Joe Pitman (aerospace consultant)
- Rachel Rivera (NASA/GSFC)
- Dan Scharf (NASA/JPL)

Preliminary Findings

1. The achieved milestones (developed and demonstrated for HabEx) are relevant to HWO, and the remaining technology gaps associated with starlight suppression and modelling, are likely small for a HWO.
 - *This is only applicable for visible wavelengths where the demonstrations occurred.*
 - *Subscale demonstrations at a larger physical size (~42mm starshade) to demonstrate scaling of vector diffraction effects would build further confidence in models.*
2. The remaining technology gap associated with petal edges, developed and demonstrated for HabEx, is likely small for a HWO.
 - *This is only applicable for visible wavelengths where the demonstrations occurred.*
3. Ultraviolet (UV) and near-infrared (NIR) band operations of starshade petal edges and starlight suppression were not demonstrated and are likely to require future performance demonstrations and analysis.
4. The remaining technology gap associated with formation-flying sensing, developed and demonstrated for HabEx, is likely small for a HWO.
5. The board declined to assign specific TRLs for these three technologies given that the HWO architecture and requirements have not yet been established.