LUVOIR Activities

11 May 2018

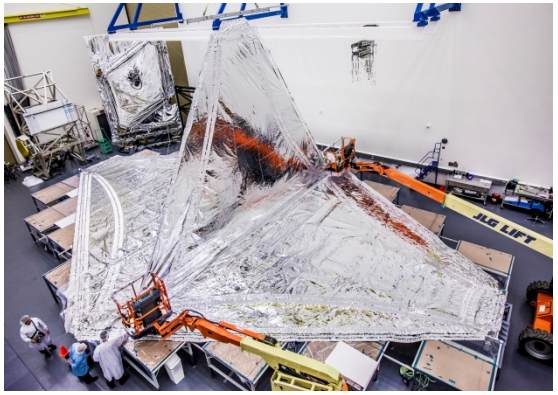
Jon Arenberg

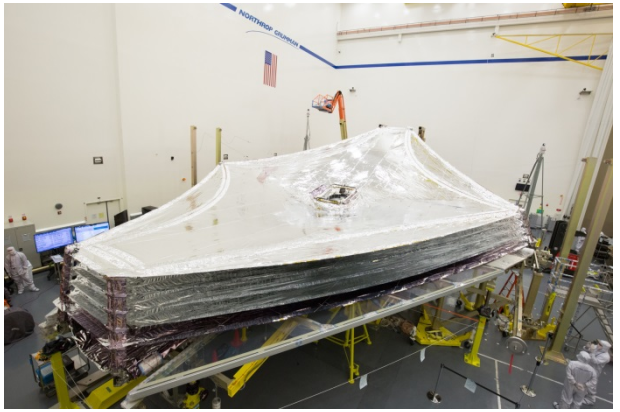
Overview

- Thermal Architecture/Sunshield-shade
- AAS Winter Meeting
- Ultra

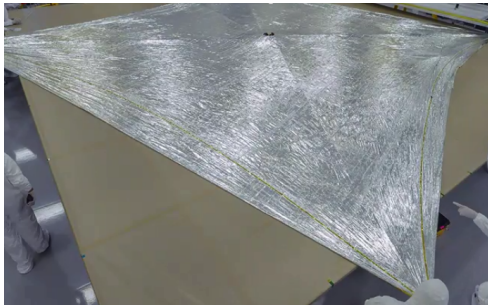
Sunshield, Sunshade

- Sunshield
  - A “high” precision shaped thermo-optical device



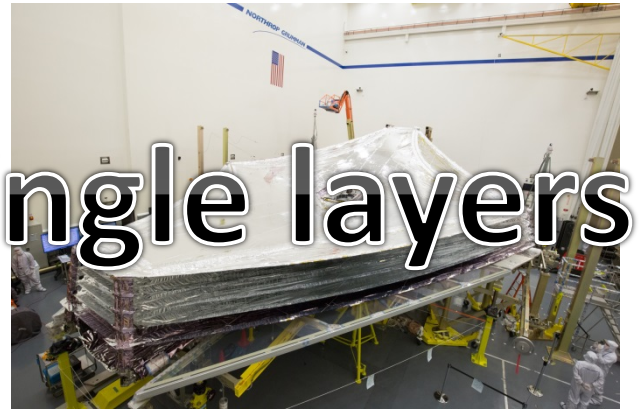


- Sunshade
  - A “low” precision shaped thermo-optical device



Sunshield, Sunshade

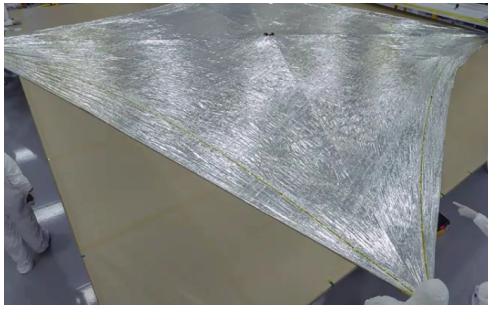
- Sunshield
  - A “high” precision shaped thermo-optical device



System of single layers

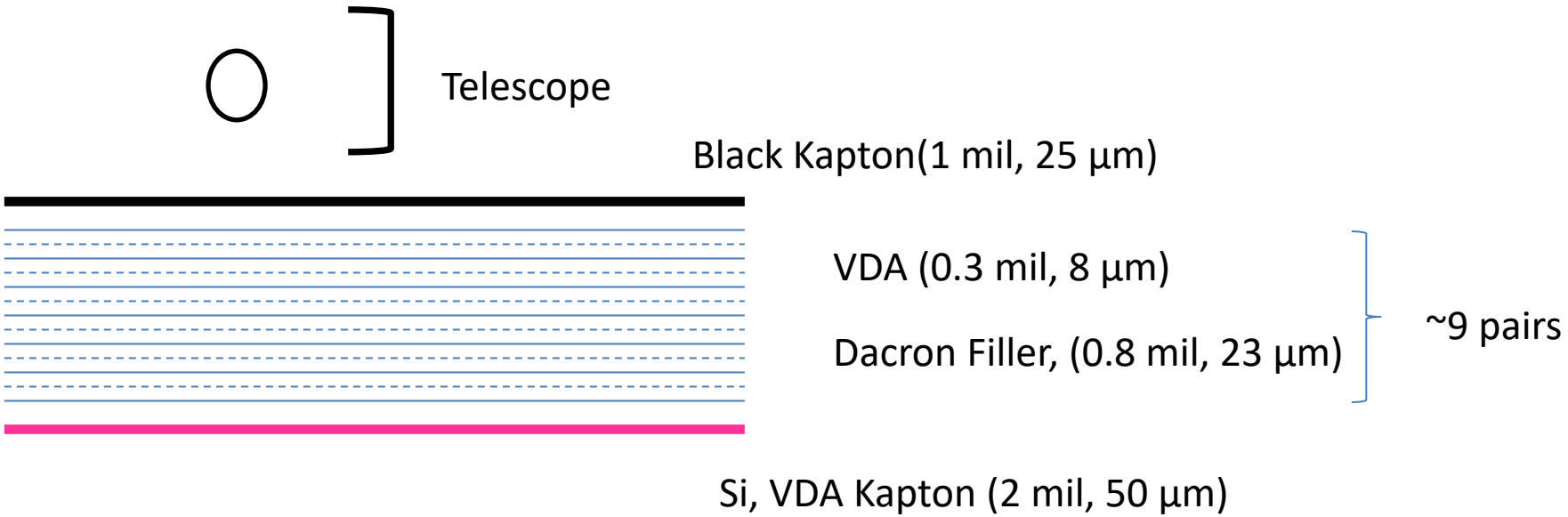
- Sunshade
  - A “low” precision shaped thermo-optical device

Blanket



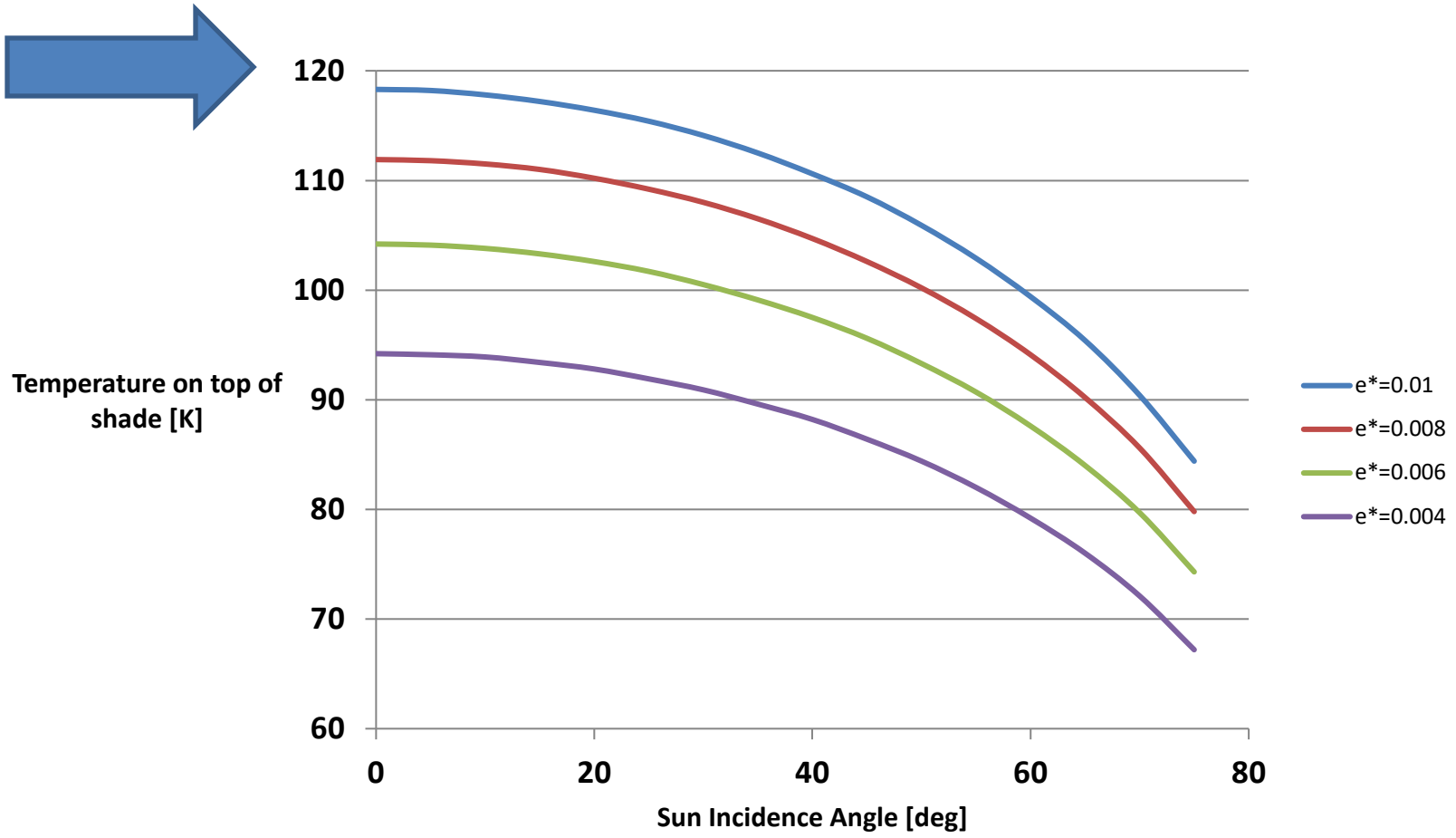
What does a sunshade look like?

- Anatomy of a blanket (not to scale)

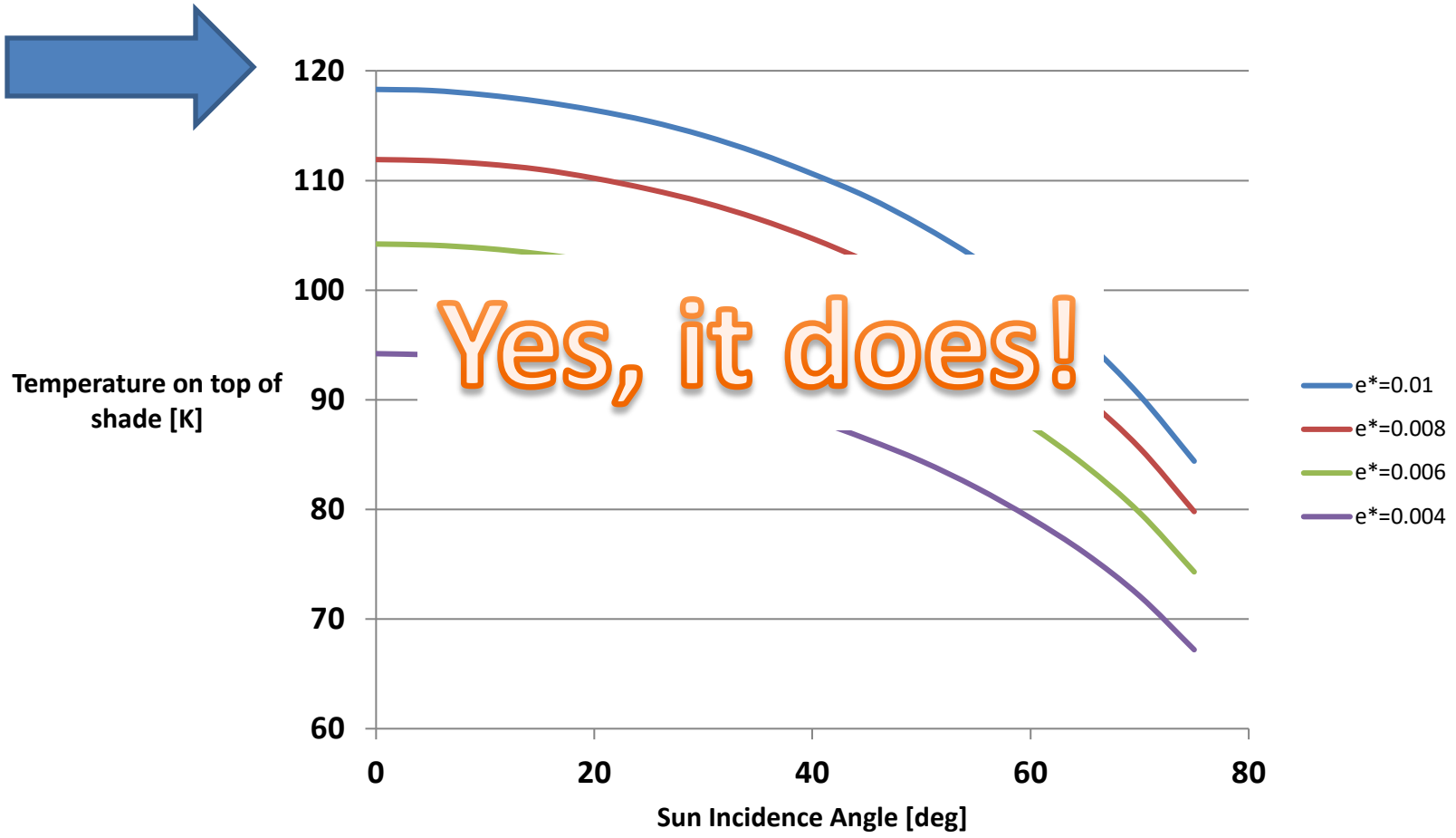


Does it work?

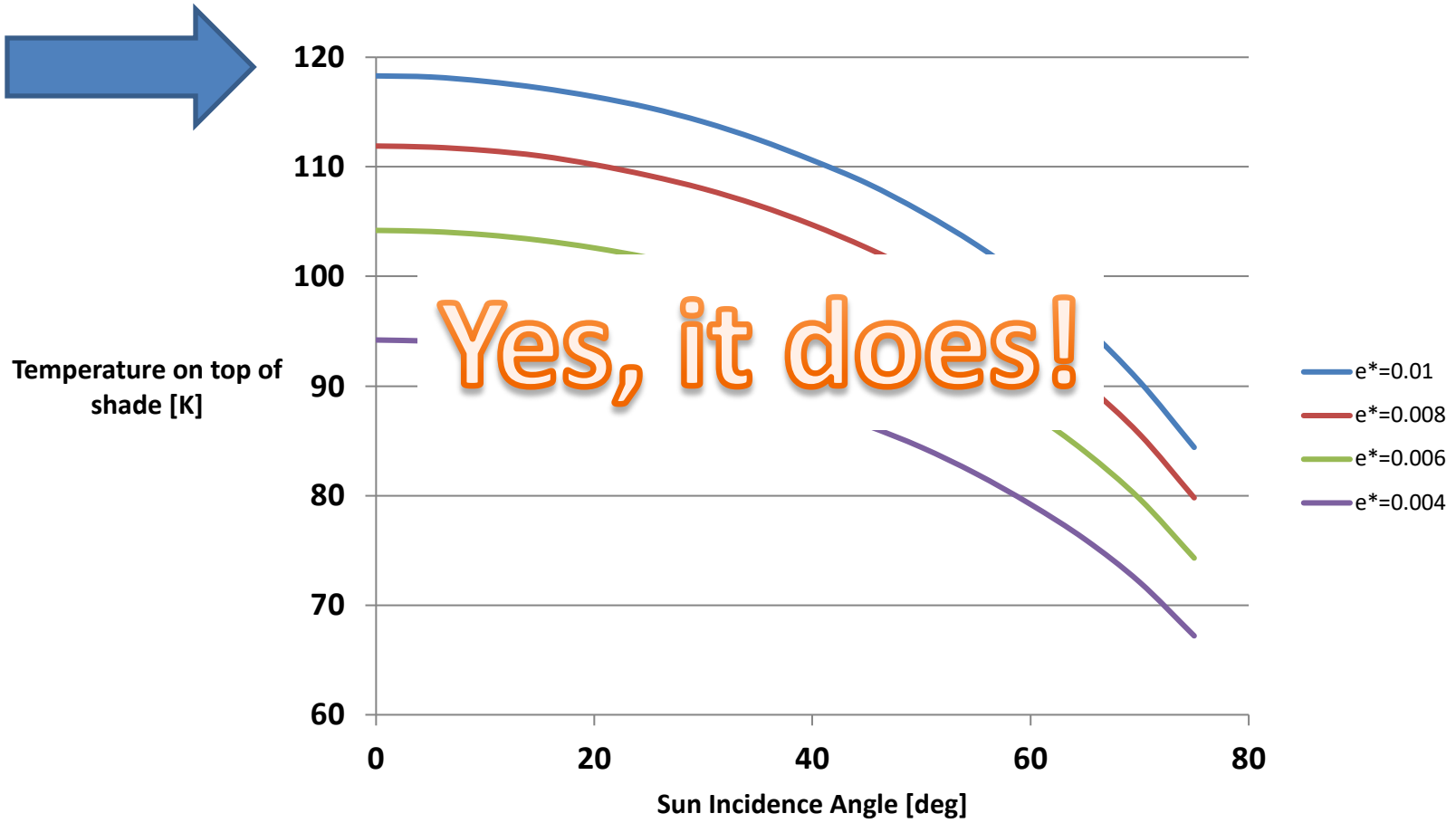
Simple Thermal Analysis Results



Simple Thermal Analysis Results

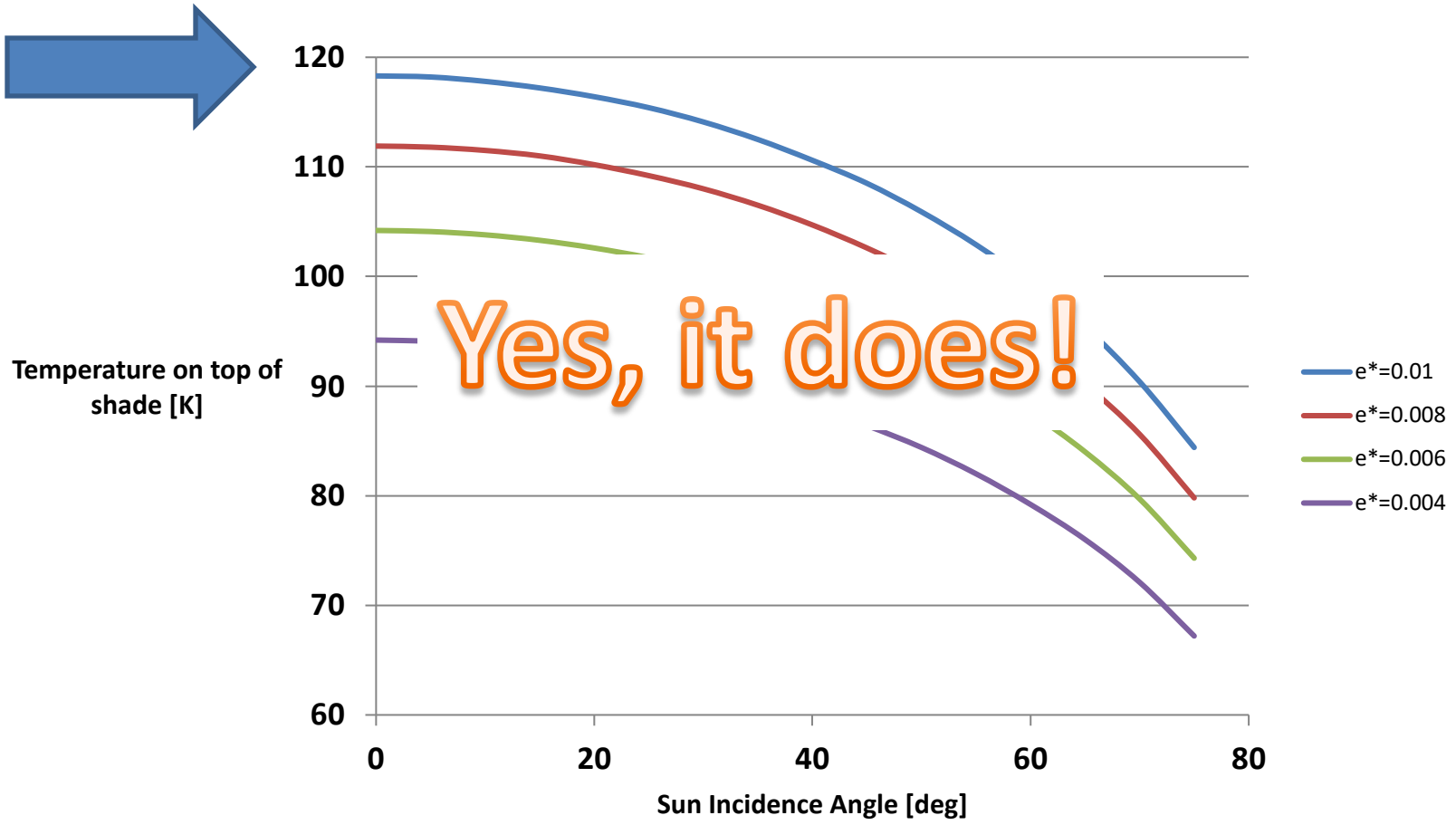


Simple Thermal Analysis Results



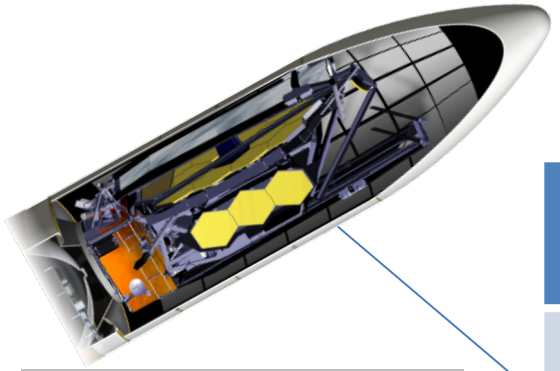
But.....

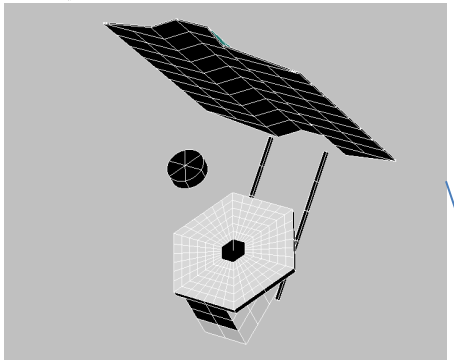
Simple Thermal Analysis Results



But…..mass, stability??

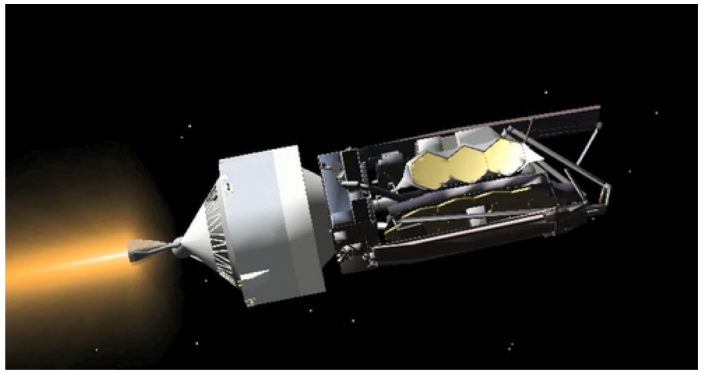
Sunshade Architectures



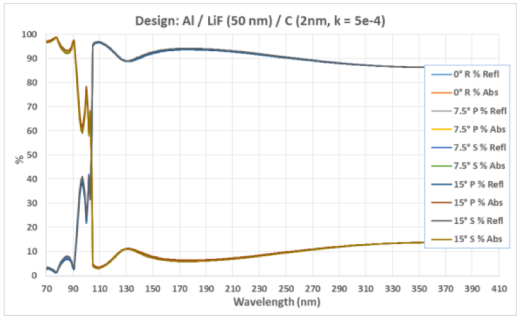


Sunshade Architecture	Pro	Con
Pallets (JWST like)	• JWST heritage • Some predeployment protection	• Not independently testable • Complicated I&T
~~Tube~~		~~Ruled out~~
Articulated Shade	• Some predpeloyment protection	• Fairing volume
Solar Sail	• Modular • Venting?	• No predeployment protection

Mirror Will See Sun Pre-deployment

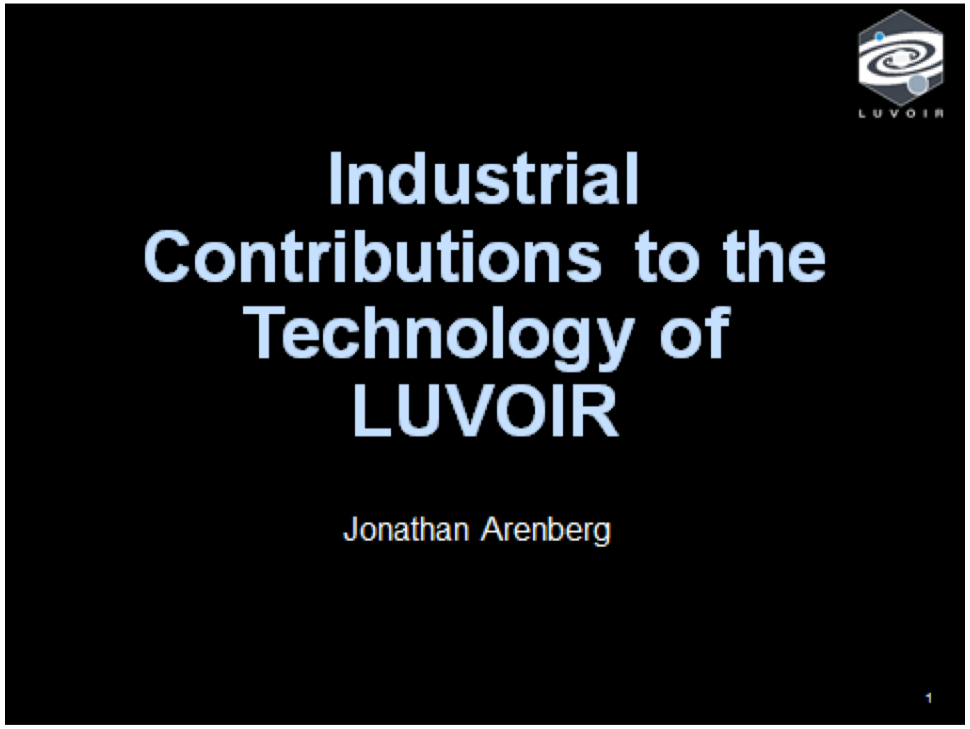


- This UV flux is bad
  - Induced photodeposition
  - Photopolymerization of “native” molecular contamination
- “Fixing” fluence occurs in seconds/minutes
  - Sunshade deployment starts at ~2 days
- Contamination will be cooked
  - Induced losses
- Trade between modularity of sunshade and mirror cleanliness



Industry's 7 minutes of fame

- Presented at the end of the LUVOIR session at AAS 231
- Ready to support an expanded session at AAS 233 (Winter 2019)
  - Just ask



ULTRA

- Systems design for ultra-stable systems
- Looking forward to starting!