

ACO Dust Mitigation for Flexible Solar Arrays (DMFlex)

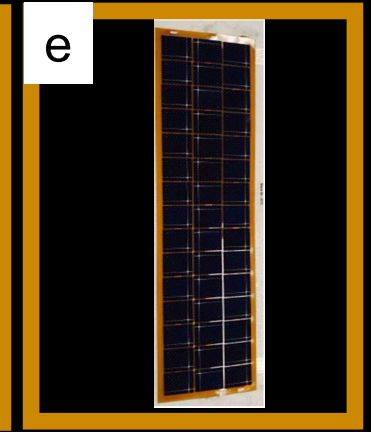
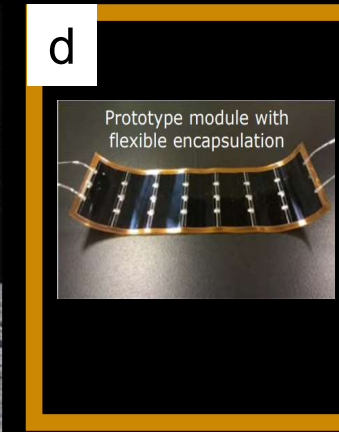
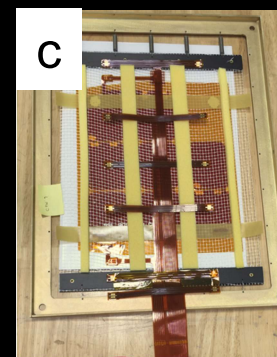
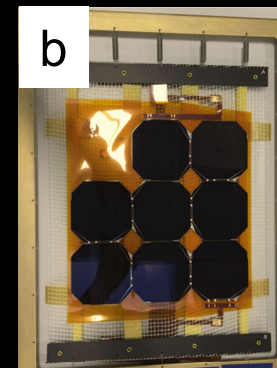
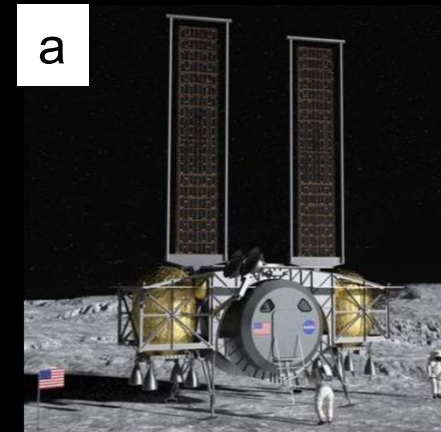
Project Overview

- Announcement of Collaborative Opportunity (ACO) with SSL-Maxar
- Purpose:
 - Evaluate blanket solar arrays with mechanical actuation for dust removal
 - Evaluate vibratory shaking and electrostatic methods for efficacy in simulated lunar environment
- Goal is to develop dust mitigation for solar arrays
 - To maintain solar array operational capability over time
 - Avoid replacement costs
 - Extend mission durations

Technical Approach

- Develop fixturing to support test article solar array and evaluate unique dust removal/mitigation methods in thermal vacuum chamber
- Evaluate solar array operational properties before and after dust deposition and after vibratory dust mitigation

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- a. Illustration depicting flexible roll out solar arrays on the Moon
- b. Dust Mitigation Test Coupon, SolAero ZTJ Module on ROSA Blanket first side
- c. Dust Mitigation Test Coupon, SolAero ZTJ Module on ROSA Blanket second side
- d. MicroLink Devices GaAs Module, Alternate PVA and Back Plane, in same size mounting frame
- e. mPower DragonSCALES Si Module, Alternate PVA and Back Plane, in same size mounting frame

Results/Summary

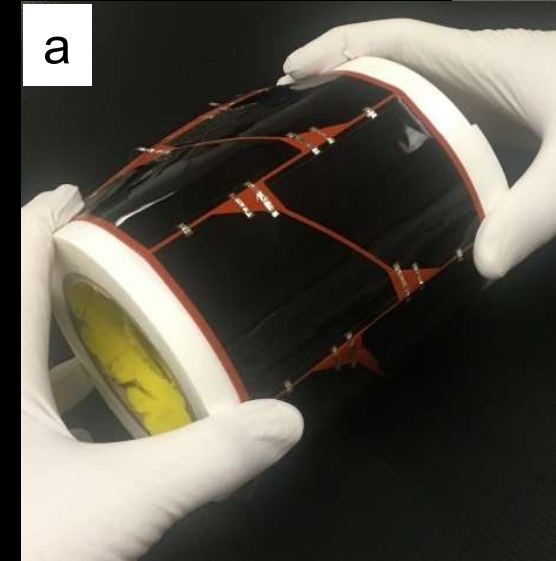
- Project just started
- Kick-off meeting, initial sample development, and fixturing development completed

Contributing Partners

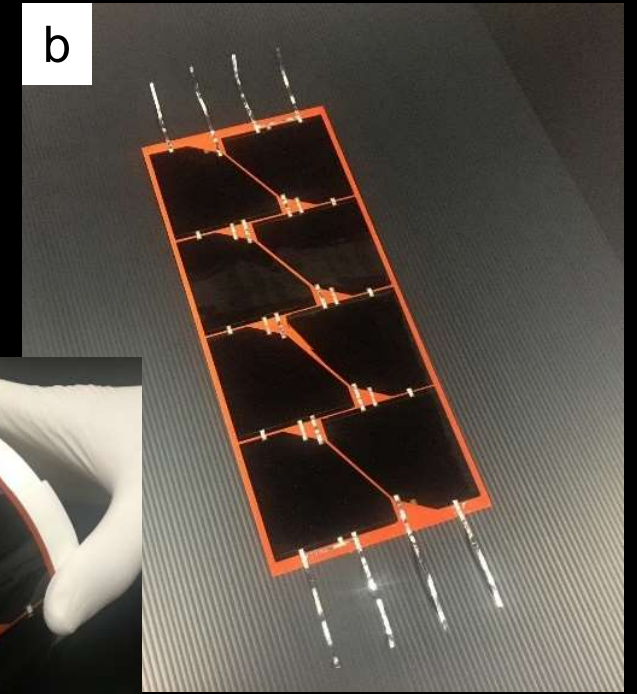
- Space Technology Mission Directorate contributes funding for DMFlex
- SSL-Maxar contributes samples (funded by SSL-Maxar) for testing
- Microlink and mPower contribute Solar Power Module samples
- DSS contributes Back Planes and sample build up

Infusion and Transition Plan

- SSL-Maxar has a strong interest in proving technology for use to maintain solar arrays in a dusty environment
 - Long term power requires protection of solar arrays, flexible modules can roll up or vibrate to remove dust
 - SSL-Maxar estimates if the technology is successful, it would cost ~\$30/W for dust mitigation vs. \$1000/W for replacement
- If successful, the use of this technology will create the first dedicated dust mitigation technique for solar arrays



a. Microlink flexible power module on roll.



b. Microlink flexible power module expanded.