

Thin-film solar arrays for small spacecraft

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The use of thin-film based solar arrays for space applications has long been recognized as an advantageous power generation option. Thinner materials yield a mass savings, equating to lighter launch loads, larger arrays, and/or more payload allocation. Further, their mechanical flexibility lends itself well to stowage and deployment schemes, allowing for a vast improvement to both specific power (W/kg) as well as stowed power density (W/m³). A key application of thin-film space solar arrays is in the small satellite community; where spacecraft are largely power starved. Their need for higher power generation coupled with the extreme mass and volume restrictions of the small spacecraft bus is driving the requirement for advanced solar arrays. And, when coupled with the relatively short operational requirements (e.g. <2years) of small spacecraft, yields the perfect application for these thin-film arrays. In this presentation, NASA's recent work on developing the Lightweight Integrated Solar Array and anTenna (LISA-T), a thin-film solar array for small spacecraft, will be discussed. The array configuration will be shown alongside bench top deployment videos, a summary of environmental testing to date, and forward plans to a flight test. Advanced, robotic additive manufacturing of the thin-film web will also be discussed.

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