

## Meteoroid Environment Measurement during the Interplanetary Cruising and in the Jupiter Trojan Region by the ALADDIN-2 Dust Detector onboard the Solar Power Sail

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The IKAROS-ALADDIN was the world's largest PVDF-based micrometeoroid detector and successfully observed the distribution of >10 micron-sized dust particles between the Earth and Venus orbits in 2010-11. For the Solar Power Sail to Jupiter Trojan asteroids, we have improved the sensor design and signal processing of the dust detector as "ALADDIN-2", based on lessons learned from the development and operation of its first generation.

We hereby report current status of these advancements and applications of the ALADDIN-2. At the IKAROS-ALADDIN sensors, stapler-type terminal connectors were employed in combination with stitching by Kevlar threads. For increasing the robustness of terminal connection over a decade of the Solar Power Sail (SPS) mission duration, grommet-type terminal with washer will be used at ALADDIN-2. For better mass estimation of impacting meteoroids, signal integration circuit is added to the ALADDIN-based electronics so that it sums up values of multiple peaks of an impact signal that are related to meteoroid mass and impact velocity. As for the SPS, the ALADDIN-2 sensors of about 4-5 m<sup>2</sup> will be mounted on the sail membrane, i.e., an order of magnitude larger than that of the IKAROS-ALADDIN, for effective detection rate of decreasing meteoroid flux against heliocentric distance. Also slow velocity impacts on the same detectors will be processed their impact signals by a newly dedicated electronics unit for better understanding the meteoroid environment nearby Jupiter TTrojan astetoids after the spacecraft rendezvous. Both hypervelocity and slow velocity impact calibration tests are currently in progress.

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