

In-situ measurement of the circumsolar dust ring around Earth's orbit by IKAROS-ALADDIN

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Circumsolar dust rings (CDR) have been discovered around several planets, i.e. Mercury, Venus, and Earth, in our Solar System by optical observations of space telescopes orbiting around Earth. To reveal the ring's fine structure including blobs and gaps formed by the mean motion resonances (MMRs) with the planet, in-situ measurement of dust number density by using deep-space probe is a powerful and complementary approach. We use the measurement data obtained by the ALADDIN in-situ dust impact detector onboard the JAXA's solar power sail, IKAROS, launched in 2010 to find the CDR structure around Earth's orbit especially the blob region behind the planet where IKAROS passed through. As a result, it is possibly found that the spatial number density of dust particles around the blob region is significantly higher than the gap region in the vicinity of the planet. Constraining the formation mechanism of CDR in the Solar System will be expected to contribute the comprehensive understanding about the dust distribution even in the exo-solar systems.