

10<sup>th</sup> International Conference and Exhibition on

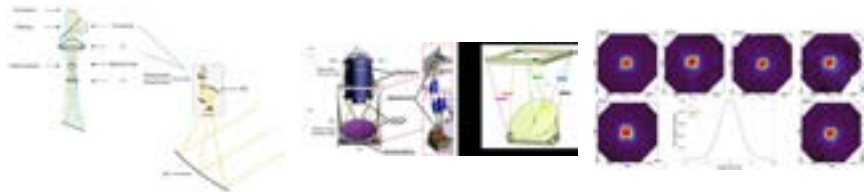
# LASERS, OPTICS & PHOTONICS

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## PILOT inflight optical performances

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**P**ILOT (Polarized Instrument for Long wavelength Observations of the Tenuous interstellar medium) is a balloon-borne astronomy experiment designed to study the polarization of dust emission in the diffuse interstellar medium in our Galaxy. The PILOT instrument allows observations at wavelengths 240 $\mu$ m and 550 $\mu$ m with an angular resolution of about two arcminutes. The observations performed during the two first flights performed from Timmins, Ontario Canada and from Alice-springs, Australia, respectively in September 2015 and in April 2017 have demonstrated the good performances of the instrument. Pilot optics is composed of an off-axis Gregorian type telescope combined with a refractive re-imager system. All optical elements, except the primary mirror, which is at ambient temperature are inside a cryostat and cooled down to 3K. The whole optical system is aligned on the ground at room temperature using dedicated means and procedures in order to keep the tight requirements on the focus position and ensure the instrument optical performances during the various phases of a flight. We'll present the optical performances and the firsts results obtained during the two first flight campaigns. The talk describes the system analysis, the alignment methods and finally the in-flight performances.



## Biography

Baptiste Mot is a CNRS Research Engineer at the Institut de Recherche en Astrophysique et Planétologie (IRAP) in Toulouse. Since 2009 he is the Project Manager of the PILOT balloon-borne experiment. He is also in charge of the system engineering and of the ground end to end tests performed on the payload. He took part in the two flight campaigns in Timmins (Canada) and Alice Springs (Australia) and he works on this two first flights' data analysis. He is involved in the conception of the satellite LiteBIRD that is the Class-L satellite mission proposed by JAXA, about to be selected by JAXA by the beginning of 2019. LiteBIRD is dedicated to the observation of the polarized emission from the CMB in order to measure the B-mode imprints of primordial gravitational waves from Inflation. He is the System Engineer of the High-Frequency Telescope that is one of the two telescopes embedded on LiteBIRD.

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