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ITALIAN SPACE AGENCY BALLOON BORNE PRESENT ACTIVITIES AND FUTURE PROGRAMMES

Abstract

This contribution will present the activities that the Italian Space Agency (ASI) is presently carrying out in the field of stratospheric balloons. ASI promotes activities from the design and manufacturing of scientific experiments to the development of technologies for the balloon chain. For the Hemera project, ended in October 2022, ASI developed an innovative telecommunication system for balloons capable to enable new payload classes and to allow the real-time download of scientific data during the flight. In addition, the Agency supported the development of various scientific payloads in astronomy, astrophysics and also in other research fields.

ASI also participates in NASA projects such as EUSO-SPB2, a technological demonstrator for measurements of ultra-high energy cosmic rays and neutrinos using fluorescence and Cherenkov emission in atmosphere that has flown from Wnaka (NZ) in May 2023, and GAPS, an instrument conceived to pioneer a novel detection technique for the measurement of the antimatter component of cosmic rays on a future flight from Antartica.

Furthermore, ASI supports the realization of national scientific payloads. In 2018 ASI flown from the Svalbard Islands the OLIMPO experiment, dedicated to measurements of the Cosmic Microwave Background (CMB) spectral distortion in the direction of rich clusters of galaxies; the result of its technological flight represents an important step in the TRL advancement of KID (Kinematic Inductance Detectors) technology. For this mission, it is under investigation the possibility of a second flight operated by NASA from Antarctica. Another mission namely LSPE/SWIPE, focused on the measurements of the CMB polarization, is currently under development. The challenge of this mission regards the flight profile: SWIPE, in fact, needs to fly in dark conditions.

This contribution will also present future plans and collaborations that ASI is envisaging for supporting the Italian scientific community that works in the field of stratospheric balloons.