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# STRATOSPHERIC BALLOONS – LOW-COST PLATFORMS FOR SCIENCE, EARTH OBSERVATION, SATELLITE DATA VALIDATION AND PREPARATION OF NEW SPACE MISSIONS

**Abstract**

Stratospheric balloons are useful platforms for various research and technology needs such as atmospheric studies and monitoring, validation of satellite data and preparation of new space and Earth Observation missions. A typical balloon flight duration varies from a few hours to several weeks, depending on the choice of season, launch site and flight trajectory. Payloads of up to 2 tons can be flown at altitudes of 20-40 km. As to atmospheric studies, balloons offer a low-cost alternative to in-situ measurements, including e.g. collection of ice or other particles, validation of satellite measurements and/or preparation of new space missions. Compared to satellites, stratospheric balloons possess relatively low cost and shorter lead times from the experiment idea to the flight, thus being particularly attractive to young researchers and students.

Recently, a new balloon infrastructure project called HEMERA has been selected by the European Commission within its programme Horizon 2020. One of the objectives of HEMERA is to enlarge the user community within research and technology related to stratospheric balloons and to coordinate activities within the field. The project is coordinated by the French space agency CNES and involves 13 partners from various European entities as well as the Canadian Space Agency, CSA. The project was kicked-off in late January and will be executed during 2018-2021.

Six major balloon campaigns with a target payload mass of 150 kg are foreseen within HEMERA offering free of charge balloon flights to users and scientists from various science fields and/or for technology tests. In addition, several sounding balloon flights are foreseen for smaller payloads of up to 3 kg. The launch sites will be Esrange in Sweden, Timmins in Canada, and Aire Sur L'Adour in France. Two Calls for Proposals are planned in the HEMERA project. The Calls are coordinated and executed by the Swedish National Space Board on behalf of the HEMERA consortium. The selected experiments will fly on balloons during 2019-2021. In additional to the balloon flight campaigns, various outreach and education activities are foreseen such as dedicated workshops for users and summer school for students. The data collected during the HEMERA balloon flights will also be accessible virtually, thus addressing various needs of users not directly involved in the HEMERA activities.

The presentation will deal with the possibilities within the HEMERA project, flight characteristics and examples on how the low-cost balloon-born infrastructure can be used for various science and technology needs.