Contribution ID: **215** Type: **Poster**

Design, Realization and Testing of an Azimuth-Stabilized Modular Stratospheric Platform

In recent years, increasing investments from space industry are directed towards single or constellations of small satellites orbiting in LEO, which have significantly low cost with respect to other types of space missions, but require many years of development and large sums on an absolute scale. The development of new facilities that can cut costs during this phase is therefore of primary interest. One of the main cost item is the development and testing of space hardware, which shall be exposed to high-vacuum and high-level-radiation environment, that is both extremely difficult and expensive to recreate in laboratory. The cheapest option is the use of near-space platforms lifted by small-scale sounding balloons, however they are not commonly employed because state-of-the-art gondolas for said balloons do not offer a stabilized frame.

The work presented in this poster shows a successful first-iteration attempt at designing and realizing a low-cost azimuth-stabilized stratospheric platform, able of self-orienting at set azimuth direction. Active attitude stabilization was achieved via the use of a single reaction wheel placed along the main vertical axis of the platform, controlled by a PI software, and was accompanied by passive attitude stabilization techniques. Tests prove that a stabilized position can be achieved within ±5° of the selected pointing direction, which is preset or directly inputted by the user during platform operations, which gives a high degree of flexibility to the operation planning. In this poster, a first application of the platform to host a payload of four solar cells is presented, but particular emphasis was given during design phase so that the integration of a different payload would require the minimum amount of re-design, i.e. the platform was developed following a modular approach.

Primary author: MARSILI, Irene (Università di Trento, Università di Pisa)