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STRATOSPHERIC BALLOONS AS A COMPLEMENT TO THE NEXT GENERATION OF
ASTRONOMY MISSIONS

Abstract

Observations that require large physical instrument dimensions and/or a considerable amount of cryogenics, as it is for example the case for high spatial resolution far infrared astronomy, currently still face technological limits for their execution from space. The high cost and finality of space missions furthermore call for a very low risk approach and entail long development times. For certain spectral regions, prominently including the mid-to far-infrared as well as parts of the ultraviolet, stratospheric balloons offer a flexible and affordable complement to space telescopes, with short development times and comparably good observing conditions. Yet, the entry burden to use balloon-borne telescopes is high, with research groups typically having to shoulder part of the infrastructure development as well. Aiming to ease access to balloon-based observations, we present the efforts towards a community-accessible balloon-based observatory, the European Stratospheric Balloon Observatory (ESBO). ESBO aims at complementing space-based and airborne capabilities over the next 10-15 years and at adding to the current landscape of scientific ballooning activities by providing a service-centered infrastructure for broader astronomical use, performing regular flights and offering an operations concept that provides researchers with a similar proposal-based access to observation time as practiced on ground-based observatories. We present details on the activities planned towards the goal of ESBO, the current status of the STUDIO (Stratospheric UV Demonstrator of an Imaging Observatory) prototype platform and mission, as well as selected technology developments with extensibility potential to space missions undertaken for STUDIO.