

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Human Spaceflight Global Technical Session (9-GTS.2)

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THE FREE FLYER ELEMENT OF DLR'S ORBITAL HUB CONCEPT: DESIGNED FOR SCIENCE
OPPORTUNITIES AND MORE

Abstract

In order to perpetuate the achievements of Human Spaceflight in the context of the International Space Station (ISS), DLR together with Airbus DS and other external partners, by strong use of its Concurrent Engineering Facility, has conducted an extensive Post-ISS concept study for an LEO architecture referred to as Orbital-Hub. The Orbital-Hub is based on a small crewed LEO platform including a human-tended Free Flyer, and its design has been centred on financial feasibility and user needs in the frame of human spaceflight. Within this paper the Orbital-Hub's Free Flyer, which consists of a pressurized laboratory area, an external payload or experiment platform and a service module, is highlighted with respect to its diverse purposes and applications. Based on a detailed collection of current and forecasted user needs with the help of the science community, the Free Flyer is designed as versatile multi-purpose platform meeting a wide range of requirements for different applications such as observation, μg applications, exploration, technology demonstration and commercial use. Furthermore, it serves as a key element in the Orbital-Hub concept during assembly and nominal operations.