Conference of Young IFAR Researchers

The SpaceLiner Concept

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ABSTRACT

The advanced, long range, hypersonic SpaceLiner concept aims to revolutionise the passenger transportation market through marrying high speed intercontinental travel with the adventure, prestige and allure of private commercial space flight and access to space. The concept itself was proposed by the DLR in 2005, and has been extensively investigated since, most recently within the framework of the EU funded, international FAST20XX and CHATT collaborative projects. Using rocket engine technologies for long-haul intercontinental passenger transport, SpaceLiner will be capable of traversing the route between Australia and Europe in 90 minutes. Such a disruptive technology has the potential to dramatically reduce travel times for passengers and diversify the currently largely homogenous aviation segment. A core idea is that the space industry will also significantly benefit from such a vehicle. With SpaceLiner planned to operate several times a day over several routes connecting key world business centers in Europe, Asia and the United States, production quantities of space technologies are expected to increase dramatically, and costs, inversely decrease. The overall effect can be expected to be a significant reduction to the cost of access to space.

However, before SpaceLiner can become a reality, considerable efforts and extensive research are still needed in order to advance the concept through to a mature stage. Throughout the course of existing studies, numerous challenges and considerations spanning various disciplines and areas, including technology, structure, thermo- and aerodynamics, safety, reusability and logistics, have been encountered and explicitly identified. Another critical consideration within the scope of the early phase studies, is the question of expected program life cycle cost. In particular the non-recurring yet prevalent development costs are of interest, with the logical question arising of whether the respective expenditures will be borne by private investors, industry, government institutions, or a combination of the latter in a public-private-partnership arrangement.

The presentation will therefore introduce the SpaceLiner concept and expand on the progress to date, while focusing on the context of the project within the DLR SART Department at the Institute of Space Systems in Bremen. Key challenges and considerations within the scope of the current SpaceLiner design phase will be discussed. Future, necessary steps to establish and pave a structured and unambiguous path for the dynamic development, design and ultimately realisation of the innovative spaceplane will also be proposed. The scientific and social frameworks of the DLR working environment which foster for the development of projects such as the SpaceLiner will also be outlined, and various existing initiatives and existing opportunities offered by the DLR, will be elaborated upon.