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Vortragstitel	Cost-driven Upper Stage Concept for Vega Evolution
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Abstract	<p>In an internal study the commercial and technical opportunities of the evolutionary development of the Vega launch vehicle have been investigated. Study objectives were: to identify market requirements and the resulting mission statement, as well as to explore design options and identify marketable concepts for a potential Vega Evolution. In the study primarily various upper stages have been investigated, with focus on tanks and structures.</p> <p>During the study, an extensive market forecast for small satellites (500 – 3500 kg) within the time frame 2010 – 2018 has been established. This forecast has been used to define the Vega Evolution performance targets for payload and costs. Subsequently, several launch vehicle concepts have been investigated, with focus on the reduction of launch costs. For each concept, system analyses have been performed, including preliminary definition of major subsystems and their configuration, mass, dimensions, and performance. Furthermore, the vehicle performance has been obtained from trajectory simulations performed by ASTOS, and from component and subsystem cost estimates (RC and NRC).</p> <p>Following the review of performance and cost, the Vega L4 concept is recommended for short term evolution. It is based on the existing Vega, but the 4th stage (AVUM) is replaced by a larger and more capable upper stage. The new stage comprises storable propellant and maximizes use of heritage components (Alphabus propellant tanks, AVUM avionics, Aestus engine, and other), which offers low development costs and low development risk. In addition, all major components considered can be obtained from European suppliers. An increase in performance allows this concept to launch two 800 kg satellites into reference orbit polar, circular LEO in 700 km.</p>