



HYBRID TURBO COMPOUND FAN ENGINE

An eco-efficient propulsion system for aviation

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Abstract. The path to electric propulsion systems depends on the development of powerful, compact and very light energy storage system with a high storage density. In order to create an environment-friendly intermediate solution in the medium term, especially for aircraft engines of medium power classes, it makes sense to use an innovative, electrically parallel hybrid unit based on rotary engines and electric booster for start and climb phases as a propulsion system. An aero-engine application, based on the HSD concept (HSD = hybrid super-drive – hybrid Wankel rotary engine) for different hybrid-parallel propulsion systems is presented. In this article, the introduced technology is based on a currently produced family of multi-component Wankel rotary engines. The proposed HSD concept uses a chamber volume of 650ccm per rotor. The projected power range (0.8 to 1.36 MW) is covered by an innovative hybrid electric parallel turbo compound concept together with 2x4 rotary engine units. A novel, air-bearing turbo engine with integrated electric drive is used as a turbocharger for charging the rotary engine. For the aero engine technology, the counter-rotating fan (CRF) concept shown as an example for an aircraft technology carrier (light jet) leads to a further increase in the efficiency of the complete system.