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## **M3Or2F-01: [Invited] Cryogenic thermo-physical properties of additive manufactured materials**

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Environmentally friendly aviation is one of the great challenges of this century. One promising approach is electric flight, in which an energy carrier (e.g. liquid Hydrogen LH<sub>2</sub>) and an electric powertrain work together. Within the scope of the joint project AdHyBau, the overarching goal is the development of new additive processes and fiber composite-metal hybrid designs for use in the cryogenic environment of such an electric propulsion system.

Additive manufacturing of complex components for use in the cryogenic temperature range down to 20K (LH<sub>2</sub>) is one essential component in the production. For the design and optimization of the different components it is necessary to know the thermo-physical behavior of such materials like high purity copper, Ti6Al4V alloy, Al-Mg-Sc alloy, and Inconel 718. The thermo-physical parameters investigated are thermal expansion, thermal & electrical conductivity and heat capacity. Further production-related influences coming from the method used (SLM, DED or coldspray) and orientational dependences are discussed.

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