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Rotorcraft Design & Analysis Capabilities in STAR-CCM+



Recent advances in automated mesh generation, availability of high-fidelity and fully-coupled physics, and increased computational power are necessary and enabling factors for CFD-based design of next generation rotor-craft systems. The incorporation of CFD estimates early in the design stage is beneficial for obtaining improved performance predictions as well as to reduce the number of design iterations required. It is with this aim that numerous physics capabilities and enhancements were added to STAR-CCM+ for complete rotorcraft simulations. Rotor performance prediction methods available in STAR-CCM+ range between virtual blade model utilizing blade element momentum theory to high-fidelity, transient overset mesh computations. This presentation highlights a number of technical validation studies namely ? rotor/fuselage interaction using overset approach tested on ROBIN helicopter, high-fidelity modeling and prediction of rotor hub drag, and fast estimation of rotor trim and performance using virtual disk model.

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