

IceANS tool: Ice Accretion Numerical Simulation. Computational Strategies

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Simulation of ice accretion on aerodynamic surfaces, rotors and other components represents an important issue for aeronautical industry. In icing simulations large and complex ice shapes are created on the surfaces embedded in large size CFD meshes. These configurations are currently computed in several steps stopping when the ice shapes becomes too large, at which point a new mesh has to be created to allow for further CFD and ice growth simulations to be performed. The whole process is very complex and involves topics such as: mesh topology generation, trajectory integration of a huge amount of simulated droplets, so to achieve a high computational efficiency is essential to address it. The nature of the problem favours the use of parallelization techniques. In this work we describe the computational strategies developed in the software IceANS (Ice Accretion Numerical Simulation) that calculates the amount of water collected by a surface immersed in a fluid flow using a Lagrangian approach and determines the shape of the new surface of the airfoil.

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