

A case study for using Chapel within the global aerospace industry

Eric Laurendeau*

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Abstract

One of the most mathematically challenging tasks within the aerospace industry is the design of the aircraft aerodynamics. Indeed, the various aerodynamic physical models involve non-linear partial differential equations of all types : elliptic, parabolic and hyperbolic. These are solved using Computational Fluid Dynamics, and require High-Performance Computing when solving for million/billion unknowns. The presentation will cover advances in the fidelity of aerodynamic models and applications to aerothermodynamic models towards ice accretion. In particular, it will highlight the use of the Chapel language in the main holistic solver within Prof. Laurendeau's aerodynamic laboratory.

*École Polytechnique Montréal