Opportunity: 17294

Robust and accurate method for solving computational fluid dynamics (CFD) and other complex problems



Applications: Aviation, Automotive, Power Generation, Engineering, Blood Flow



Unified mesh/meshfree CFD with mixing of nodes and points



Simulation of the space shuttle



Double-wall turbine cooling

A unified mesh/meshfree method for computational fluid dynamics without complex mesh treatment and failures at mesh/meshfree boundaries

Features	Benefits
 Combines the geometric flexibility of meshfree CFD with the physical accuracy of mesh methods 	As general, automated, efficient, and flexible as meshfree methods but more stable and accurate
 Avoids poor accuracy of previous meshfree methods 	High accuracy simulation of physical systems
 Automatic mesh generation without manual adjustment 	Avoids need for time consuming input by experts
 Inherently avoids meshing failures (negative- volume elements; low-quality elements) 	Robust simulation without meshing failures and artifacts
 Suits arbitrarily complicated configurations even with moving boundaries 	Straight forward simulation of complex geometries including moving surfaces
 Can be applied to other physical problems governed by the complex advection-diffusion PDEs 	Could be applied to fluid mechanics, solid mechanics, electromagnetism, etc.

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