

SIAM MPE Community Meetings: Colloquium

Prof. Francis X. Giraldo

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Time-integration Strategies for Non-hydrostatic Atmospheric Models

Abstract: We begin with a motivation for the challenges faced in weather and climate modeling and then describe why we need special time-integration methods in order to evolve the governing equations forward in time. A quick review of element-based Galerkin (EBG) methods that we use in our models will be given followed by a description of the contravariant form of the discretization that then simplifies the application of horizontally explicit vertically implicit (HEVI) time-integrators regardless of whether we are solving regional or global models. This talk is motivated by my group and collaborators' research in building operational weather prediction models as well as advancing the field for application in climate, space weather, and ocean dynamics. A list of publications on these topics can be found at: <https://frankgiraldo.wixsite.com/mysite/publications>

Biography: Francis Giraldo is a distinguished professor in the Department of Applied Mathematics at the Naval Postgraduate School in Monterey, California. He is in the Scientific Computing group and mostly teaches and performs research in this area. For example, he teaches Numerical Linear Algebra, Numerical Analysis, Galerkin Methods, and Scientific Computing. He is also an Adjunct Professor of Applied Mathematics at the University of California at Santa Cruz. His research area is in numerical methods for partial differential equations (PDEs). Although he mainly works on nonlinear systems of hyperbolic equations, he also works on elliptic and parabolic PDEs.

Thursday, Mar. 28, 2024

11:00 AM EST

Zoom link: siam.zoom.us/j/81561821731

Hosts:
Irina Tezaur and Pierre Lermusiaux
<http://mseas.mit.edu>

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