Frontiers of Scientific Computing Lecture Series

Can the Gulf Coast Protect Itself from Hurricane Storm Surge?

Clint Dawson, University of Texas at Austin

Professor

Digital Media Center 1034
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Abstract:
The active hurricane seasons of the past decade have resulted in significant efforts to understand risk and attempt to mitigate storm surge from hurricanes and tropical storms. Mitigation systems may consist of shoring up existing levees and seawalls, building new structural protection systems, or maintaining or creating natural systems such as barrier islands and wetlands. Modeling and computer simulation are central to investigating the efficacy of these systems. Mathematical models and algorithms which are multi-scale, multi-physics, and high fidelity are required for these efforts. In this talk, we will describe two modeling systems for studying the impacts of surge and waves, and the application of these models to studying built and natural storm surge protection systems. The first model is the well-known Advanced Circulation Model (ADCIRC), which has been widely used to study Gulf storms. We will describe recent studies where this model has been applied to proposed mitigation systems in the Houston-Galveston region, and the complexities associated with these types of studies. The second model we will discuss is a novel fluid-structure model, based on large eddy simulation coupled with a beam equation, for modeling flow through dense and flexible vegetation. Applications to flow through wetlands will be described.

Speaker's Bio:
Clint Dawson received BA and MS degrees from Texas Tech University and his PhD from Rice University. He was an NSF Postdoctoral Fellow and Dickson Instructor at the University of Chicago. He began his academic career at Rice University, and soon after moved to the University of Texas at Austin. He is a professor of aerospace engineering and engineering mechanics, and holds the John J McKetta Centennial Energy Chair in Engineering. He is also an affiliate of the Institute for Computational Engineering and Sciences at UT Austin.

This lecture has a reception @ 01:30 pm

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