東京大学グローバルCOEプログラム　機械システム・イノベーション国際拠点

東京大学 THE UNIVERSITY OF TOKYO

GMSI Global Center of Excellence for Mechanical Systems Innovation

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# High Resolution, High Performance Modeling of Storm Surge and Inundation using ADCIRC


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By 2015, over 60% of the U.S. population is expected to live in these areas. In the late 1990s, coastal infrastructure in the Gulf and Atlantic coastal regions alone was worth about $3 trillion. More than one-tenth of the nation's annual gross domestic product and 16 million jobs are directly attributable to the industries located in the coastal zone. Yet, these heavily populated and economically significant regions are susceptible to some of the most destructive forces in nature, including tsunamis, floods, and tropical cyclones. The risk of living in these areas is even greater when factors such as global climate change and associated sea level rise are taken into consideration.

While considerable effort has been invested over the past half century in developing the computer models that underlie our current weather forecasting capabilities, predictive models of the waves, storm surge and flooding that are responsible for much of the damage associated with the most severe coastal storms are much less mature.

I'll discuss the coupled ADCIRC + SWAN storm surge and wave models, which have recently provided a major step forward in our ability to utilize modern day, high performance computing capabilities to model coastal waves and storm surge associated with tropical cyclones and other strong coastal storms. Applications of these models require solving for spatial scales ranging from 100s of kilometers to 10s of meters and pose a highly challenging computational problem. Examples are provided of how these models are being used to evaluate past storm impacts, to provide design and planning guidance and for future storm predictions.


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