

Distinguished Colloquium

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for Quantum Science and Engineering
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Friday, November 7, 2014
2:00 pm, HH-3017

Malaysia Airlines Flight MH370: A Modeling and Numerical Simulation Study of airplane Crash and Water Landing

Abstract:

On March 8, 2014, Malaysia Airlines flight MH370 disappeared less than an hour after take-off on a route from Kuala Lumpur to Beijing. Its mysterious fate is one of the most intriguing stories of the year 2014, but the available evidence has indicated that the airliner has crashed into the Indian Ocean. Its search and recovery operation also has constituted the most expensive one in the aviation history so far. In this talk, the speaker will first revisit the study of crashing and ditching of aircraft into the ocean as a classical water-entry problem in applied mathematics. Then the entry of an airliner into the ocean will be modeled as a two-phase fluid-structure interaction problem with compressible aero-hydrodynamics and six-degree of freedom of motion. Numerical simulations are performed by using the OpenFOAM software. Several video simulations of dynamic motion of an airliner flying into the ocean will be shown. Impact damage will also be assessed based on the analysis of the Space Shuttle Challenger disaster.

This is joint work by G. Chen, C. Gu, P.J. Morris, E.G. Paterson, A. Sergeev, Y.-C. Wang and T. Wierzbicki.