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Weather Encounter Damage on Aerospace Structures at Hypersonic Conditions

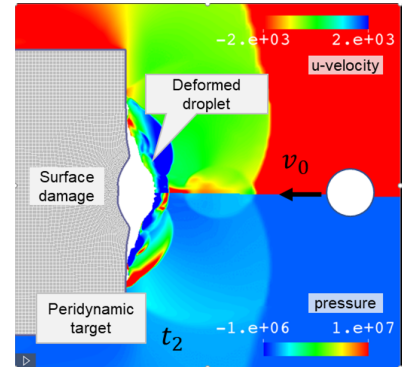
SPEAKER

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ABSTRACT

There is renewed interest in hypersonic flight in the aerospace domain. Nontrivial chances of weather encounters with airborne particles (raindrops, ice particulates, volcanic ash) exist at lower altitudes. Predicting structural damage due to raindrops at hypersonic velocities is an open problem owing to the complex multiphysics involved. This talk will first describe the physics of the high-speed droplet impact and then demonstrate a computational solid mechanics approach, peridynamics, for damage predictions. Droplet-shock layer interactions, coupling with computational fluid dynamics, 2D vs. 3D, and other relevant topics will be discussed.



ABOUT THE SPEAKER

Prof. Guven is an Associate Professor of Mechanical and Nuclear Engineering at Virginia Commonwealth University (VCU). He was an Assistant Professor of Materials Science and Engineering at The University of Arizona. Ibrahim spent two summers as a Faculty Fellow at the U.S. Air Force Research Laboratory. He was a Visiting Professor at the University of Rennes I, France, multiple times. Ibrahim is a recipient of the NASA Group Achievement Award for “outstanding work in developing materials for space exploration,” which was awarded to participants of the collaborative project he worked on: US-COMP Space Technologies Research Institute.



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OCTOBER · 10 · 2025
FRIDAY 13:30
EA-101