

Impact Modeling of Composites

Special Session at the Sixth M.I.T. Conference on Computational
Fluid and Solid Mechanics

<http://www.sixthmitconference.org/>

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Summary

Flexibility in the choice of constituents can give composite structures a combination of high ballistic resistance and low areal density. This makes them uniquely suitable for diverse armor and shielding applications where both protection and mobility are desired. However, achieving modeling sophistication for a complex process like impact on a composite structure is extremely challenging. Various mechanical and thermal phenomena arise in very short duration of impact resulting in strong gradients, large deformation, material failure, induced anisotropy, phase change and various nonlinearities due to their interactions. There is a need to simultaneously develop both modeling framework which address the underlying physics as well as accurate and efficient computational tools that can handle complex geometries and high strain rates. The present special session aims to invite papers which can shed light on the advances made in the area of both modeling and computation that can be used to predict impact response of composite systems.

Target Areas

- Finite element analysis of ballistic impact and blast loading of composites
- High strain rate modeling of polymer, ceramic and fiber materials
- Multi-scale methods for dynamics response of composites

- Analytical modeling of ballistic impact
- Progressive damage, dynamic failure and fragmentation modeling
- Wave propagation in heterogeneous media
- Shock modeling
- Application of Discontinuous Galerkin methods
- Cohesive zone modeling of interfaces
- Meshing issues pertaining to Eulerian, coupled Lagrangian-Eulerian, arbitrary Lagrangian-Eulerian and other remeshing techniques
- Meshless methods for high strain loading

Submission Guidelines

Please send one-page abstracts to any of the organizers with the email subject - 'Abstract for 6th MIT Conference' by 15th of February, 2011. It is important that the abstracts follow exactly the format given on the conference web site (<http://www.sixthmitconference.org/>). Abstracts not following the format will be returned to the authors for formatting. The email addresses are given below:

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