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SPG and Peridynamics for Material Failure Analysis

Instructors: Youcai Wu (Ph.D.) – SPG, Bo Ren (Ph.D.) – Peridynamics

2 Days - $400, Students $200 w/student ID
Includes on-site continental breakfasts, lunches, breaks, class notes, class dinner
Includes 30-day demonstration license

Prerequisite: Students should be familiar with LS-PrePost, understand the basic LS-DYNA keywords and be able to run an LS-DYNA simulation

Objective: This two-day intermediate level class is intended for attendees who are using the LS-DYNA code for their advanced dynamic material failure analyses in solids and composites. It is of particular interest to LS-DYNA users in the automotive, aerospace and defense industries for modeling various material failure scenarios in design, manufacturing and safety of vehicle, aircraft and weapon systems.

Description:
The smoothed particle Galerkin (SPG) method is a new Lagrangian particle method for simulating the severe plastic deformation and material rupture taken place in ductile material failure. The Peridynamics method is another compelling method for brittle fracture analysis in isotropic materials as well as certain composites such as CFRP. These two numerical methods share a common feature in modeling the 3D material failure using a bond-based failure mechanism. Since the material erosion technique is no more necessary, the simulation of the material failure processes becomes very effective and stable.

In this class, attendees will learn the basic principles behind each numerical method, theoretical and practical considerations in creating the computer model for material failure simulation, research breakthroughs and numerical advantages in these two methods. The class will also offer attendees an in-class workshop and help them interpret numerical results to assure the physics has been properly restored.

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