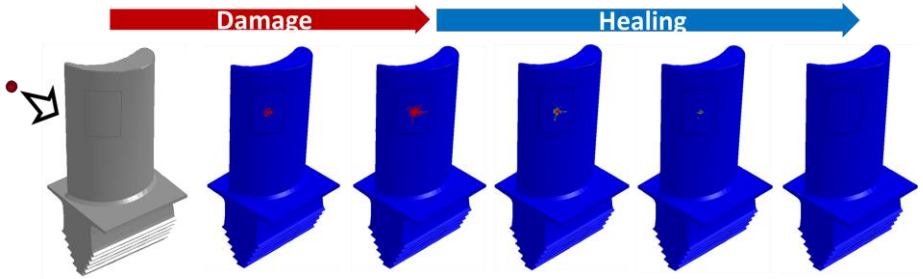
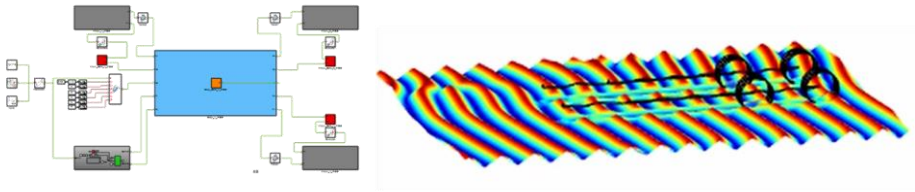
Applied Solid Mechanics Laboratory

Computational mechanics; Ceramics; Super alloy; Terramechanics; Exploration rover

Our laboratory conducts practical modeling for solid deformation, fracture, and frictional contact phenomena based on fundamental mechanics and elastoplastic theory. We also conduct numerical simulations using proposed models in addition to basic experiments for various specific engineering problems, with the aim of contributing to the optimal design and control of mechanical systems and materials, as well as their high reliability.



FEA of self-healing ceramic turbine blades



Traveling simulation of lunar and planetary rover

Specific research themes include “fracture statistics of materials in extreme environments” and “research on the interaction between the ground and machines , called terramechanics.” The figure on the left shows an example of finite element analysis of foreign object damage behavior in self-healing ceramics using the proposed damage-healing model. We are also working on the development of a rover traveling simulator assuming in Lunar and Martian environments.

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