

Einladung zum Vortrag

The Inequality Level Set, a novel approach to handle variational inequalities: application to contact

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The key idea of the ILS for variational inequalities is to try to locate with a level set the domain over which the inequality reaches an equality. For contact problem, it means that the main unknown is the contact zone. This is an important departure from classical contact algorithm since at any iteration an explicit contact contour is known as a level set. A true Newton-Raphson may thus be built with respect to the contact location. The derivative of the energy with respect to the contact zone location has the meaning of a configurational force. For frictionless contact it must be driven to zero to reach the exact contact zone, whereas in case of adhesion the force must correspond to the adhesion level.

The two main advantages of the ILS are: possibility to enrich with the XFEM the contact zone boundary to capture non-smoothness of the displacement field (higher order order of convergence contact is thus at hand) and robustness in the iterative process since it is based on a full Newton-Raphson.

Examples of simulation of contact of membranes or deformable bodies on a rigid obstacle will show the capabilities of the ILS.

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