Sweeping process in stress-based models of elastoplasticity

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The connection between plasticity phenomenon in mechanics and the sweeping process was noticed since the very discovery of the sweeping process as a mathematical problem. Specifically, when the stress distribution is considered as a state variable, the "moving set" of a sweeping process reflects the interplay between the "elastic range" characteristic of an elastoplastic material and the constraint of quasistatic equilibrium.

In this presentation we will discuss several nontrivial models which are based on this idea, and pay attention to the accompanying challenges. The application of control algorithms for sweeping process to such models is of further interest.