1077-49-936   **Janos Turi***, turi@utdallas.edu, and **Alain Bensoussan**. *Optimal Control of Variational Inequalities.*

We consider control problems for the variational inequality describing a single degree of freedom elasto-plastic oscillator. We are particularly interested in finding the "critical excitation", i.e., the lowest energy input excitation that drives the system between the prescribed initial and final states within a given time span. This is a control problem for a state evolution described by a variational inequality. We obtain Pontryagin's necessary condition of optimality. An essential difficulty lies with the non continuity of adjoint variables. We define an algorithm which leads to the optimal control. (Received September 14, 2011)