Filippov sliding motion on a co-dimension 2 discontinuity surface

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In this talk we consider sliding motion, in the sense of Filippov, on a discontinuity surface Σ of co-dimension 2. In particular, we consider a certain Filippov sliding vector field f_F recently adopted by Dieci and Lopez and show that it enjoys several important properties.
First, restricting to the case of *nodally attractive* Σ, we show that this Filippov vector field is the limiting vector field for a natural regularization of the original problem.
Then, we characterize, and restrict to, the general case of Σ being *attractive through sliding*, and show that f_F exists and is unique. We also propose a characterization of *first order exit conditions*, clarify its relation to generic co-dimension 1 bifurcations phenomena (losses of attractivity) for Σ, and examine what happens to the dynamics on Σ for the vector field f_F.

The talk is based on the works:

(1) "A Filippov sliding vector field on an attracting co-dimension 2 discontinuity surface, and a limited bifurcation analysis", by L. Dieci, C. Elia, L. Lopez.

(2) "Regularizing piecewise smooth differential systems: co-dimension 2 discontinuity surface", by L. Dieci, N. Guglielmi.