Maria Elena Valcher, *On the stabilization of continuous-time positive switched systems*

ABSTRACT: In this talk exponential stabilizability of continuous-time positive switched systems is discussed.It is shown that, when dealing with two-dimensional systems, exponential stabilization can be achieved if and only if there exists a Hurwitz convex combination of the (Metzler) system matrices. However, for systems of higher dimension this is not true.
In general, exponential stabilizability corresponds to the existence of a (positively homogeneous, concave and co-positive) control Lyapunov function, but this function is not necessarily smooth. The existence of an Hurwitz convex combination is equivalent to the stronger condition that the system is not only exponentially stable, but it also admits a smooth control Lyapunov function.