

1164-37-57

Iacopo P. Longo* (iacopo.longo@ma.tum.de), , Germany, and **Sylvia Novo** and **Rafael Obaya**. *Topologies of continuity for Carathéodory delay differential equations with applications in non-autonomous dynamics.*

This talk deals with delay differential equations of the type

$$x'(t) = f(t, x(t), x(t-1)), \quad t \in \mathbb{R}, x \in \mathbb{R}^N,$$

where f satisfies Carathéodory conditions. This means that f is only required to be Borel measurable in the product space and locally integrable in t on bounded subsets of \mathbb{R}^{2N} . The lack of results of continuous variation of the solutions under such mild assumptions, prevented from applying many theoretical tools to analyze the qualitative behavior of such systems in models from engineering and applied sciences. We study strong and weak metric topologies of integral type to solve this far-from-trivial question. The first direct consequence is the continuity of the skew-product semiflows composed of the flow on the *hull* of a Carathéodory function (satisfying appropriate assumptions) and of the solutions on a suitable phase space of the associated delay differential equation. We shall treat the general case as well as the monotone one. These results unlock a whole variety of tools which permit a richer qualitative analysis of the local and global behavior of the solutions of which we shall give a quick overview. (Received January 11, 2021)