

1111-34-517

Alexander Lohse* (alexander.lohse@math.uni-hamburg.de) and **Sofia Castro**. *Existence and stability of elementary heteroclinic networks in \mathbb{R}^4* .

In this talk we look at constructions of heteroclinic networks from simple robust cycles in \mathbb{R}^4 : considering only non-homoclinic cycles and assuming that there are no critical elements (i.e. equilibria, periodic orbits or heteroclinic cycles) other than the origin and the network itself, we are able to show that only very few ways exist by which cycles can be joined together in a network. We call such networks *elementary* and provide a complete list of them for \mathbb{R}^4 . Some of these networks have been previously studied in great detail by other authors, while others, especially those of type *A*, are so far absent from the literature. Using the stability index from Podvigina and Ashwin (*Nonlinearity* 24, 887–929, 2011), we describe the non-asymptotic stability properties of individual cycles and, where possible, derive information about stability of the entire network, which is strongly dependent on the types of the cycles. (Received February 09, 2015)