



Centro de Matemática
Universidade do Porto

Dynamical Systems Seminar

Date. April 12, **14h00**

Place. Room M031

Speaker. Alexander Lohse¹ (University of Hamburg)

Title. Non-asymptotic stability properties of type B heteroclinic cycles in \mathbb{R}^4

Abstract. In this talk we will investigate non-asymptotic stability properties of simple, robust heteroclinic cycles for an ode $\dot{x} = f(x)$, that are contained in a three-dimensional subspace of \mathbb{R}^4 . Such cycles are referred to as type B . There are four qualitatively distinct cycles of this type in \mathbb{R}^4 , differing in the number of equilibria ξ_j involved and the structure of the symmetry group Γ that guarantees robustness. Necessary and sufficient conditions for asymptotic stability of these cycles (and, in fact, for a far more general class) have been obtained by Martin Krupa and Ian Melbourne in the 1990s. Using recent results on the stability index that was introduced by Peter Ashwin and Olga Podvigina in 2011, we deduce necessary and sufficient conditions for predominant asymptotic stability as well as predominant and complete instability of type B cycles. These can be expressed in terms of eigenvalues of the linearization $(df)_{\xi_j}$. In particular, we discover that type B cycles in \mathbb{R}^4 are never predominantly unstable.

Remark. Coffee is served before the talk (**13h45 - 14h00**)

¹Alexander Lohse is a Ph.D. student under the supervision of Prof. Reiner Lauterbach.