# Recurrent sets and Lyapunov functions

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For a homeomorphism on a compact metric space the existence of a continuous Lyapunov function – which is not a first integral – can be deduced from the study of recurrent sets. We will analyze this link, recalling the main definitions and giving some examples. Then, we will address the following question: when is the property of admitting a non-trivial Lyapunov function stable under $\mathcal{C}^0$ perturbations? We will explain how this problem is related to the phenomenon of GR-explosions and we will discuss some conditions that guarantee such a stability. This is a joint work with O. Bernardi and J. Wiseman.

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