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Shape theory of continuations of attractors and bifurcations

The study of the continuations of isolated invariant compacta is an important part of the Conley index theory of flows. In this talk we examine some dynamical and topological features of the continuations of attractors. If we have a parametrized family of flows in a manifold and K is a connected attractor of the initial flow, we consider the spectrum of K, which is an isolated invariant compactum of the terminal flow that "survives" all the possible continuations of K. In fact, the spectrum is a tame quasi-attractor whose global topological properties agree with those of K. These global properties are formulated in terms of shape theory and Čech homology and cohomology. We also study bifurcation properties of flows in manifolds related to the transition from asymptotic stability to complete instability, not only in the case of points or periodic orbits but also in the case of general attractors of flows in manifolds. These bifurcations can also be examined using those parts of Topology designed to study spaces from a global point of view, in particular shape theory, Čech homology and the classical duality theory of manifolds.