Remote Limit Points on Surfaces

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Abstract

A flow (continuous real action) on a compact orientable surface M of genus greater than one (a sphere with at least two handles) has sufficient room for orbits to wrap around one of the handles in an exotic fashion. Specifically, an orbit that is wrapping around one handle can, between wraps, spend increasing amounts of time wrapping and unwrapping around a second handle before returning to the first for the next wrap around it. As a result the omega limit set of such an orbit can contain a simple closed curve of fixed points around the second handle in spite of wrapping around the first handle. In an earlier paper the authors constructed such a flow from this perspective and studied its lift to the universal covering space of the surface. In this talk it is shown that many of the properties of the example are consequences of a general theory that extends classical limit cycle theory.