

# Advances on the topological characterization of $\omega$ -limit sets for analytic flows on open subset of the sphere

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In 2007, V. Jiménez and J. Llibre presented (in [1]) a topological characterizations of the  $\omega$ -limit sets for analytic flows on (open subsets of) the sphere and the projective plane. Their proof is based on an auxiliary lemma stating that analytic flows on arbitrary analytic surfaces have the following property (stated here without intention of being rigorous): if an orbit meets both sides of an arc of singular points contained in its  $\omega$ -limit set, then the flow must be equally oriented in both sides.

Despite the validity of the statement of the lemma above for the plane, the sphere and the projective plane, the statement is no longer true for general surfaces. Some examples on proper open subsets of the plane and the torus will be shown. Therefore, the characterizations given in [1] are incomplete; in the poster we shall present a correct proof for the lemma in the case of the whole sphere and the whole projective plane and shall give correct characterizations for  $\omega$ -limit sets on open subsets of the sphere.

- [1] V. Jiménez and J. Llibre, A topological characterization of the  $\omega$ -limit sets for analytic flows on the plane, the sphere and the projective plane, *Advances in mathematics*, 216 (2007), 677–710.