

# The geometry of quadratic vector fields possessing semi-elemental saddle-nodes

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## Resumo

Planar quadratic differential systems occur in many areas of applied mathematics. Although more than one thousand papers have been written on these systems, a complete understanding of this family is still missing. One of the goals of recent researchers is the topological classification of quadratic systems. As this attempt is not possible in the whole class due to the large number of parameters (twelve, but, after affine transformations and time rescaling, we arrive at families with five parameters, which is still a large number), many subclasses are considered and studied. In this talk we present the study a subfamilies of quadratic systems possessing a finite semi-elemental saddle-node and an infinite semi-elemental saddle-node formed by the collision of an infinite saddle with an infinite node. The bifurcation diagram for this family is tridimensional and yields 370 topologically distinct phase portraits. Invariant polynomials are used to construct the bifurcation sets and the phase portraits are represented on the Poincaré disk. The bifurcation sets are the union of algebraic surfaces and surfaces whose presence was detected numerically. This is a joint work with Joan Carles Artés (UAB-Barcelona) and Regilene Oliveira (ICMC-USP).