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Global phase portraits of planar piecewise linear refracting systems of saddle-saddle type.
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Summary: This paper deals with the global dynamics of planar piecewise linear refracting systems of saddle-saddle type with a straight line of separation. We investigate the singularities, limit cycles, homoclinic orbits, heteroclinic orbits and make the classification of global phase portraits in the Poincaré disk for the refracting systems. We prove that these systems have 18 topologically different global phase portraits.

MSC:
34C05 Topological structure of integral curves, singular points, limit cycles of ordinary differential equations
34A36 Discontinuous ordinary differential equations
34C23 Bifurcation theory for ordinary differential equations
34C07 Theory of limit cycles of polynomial and analytic vector fields (existence, uniqueness, bounds, Hilbert’s 16th problem and ramifications) for ordinary differential equations
34C20 Transformation and reduction of ordinary differential equations and systems, normal forms

Keywords:
refracting systems; singularities; limit cycles; phase portraits

Full Text: DOI

References:
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[16] Li, S.; Liu, C.; Llibre, J., The planar discontinuous piecewise linear refracting systems have at most one limit cycle, Nonlinear Anal. Hybrid Syst., 41, 101045-1-14 (2021)


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