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OUTER BILLIARD AROUND A CURVILINEAR TRIANGLE WITH A FIXED DIAMETER

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In memory of Rafał Kołodziej

Abstract: We consider an outer billiard around a Reulaux triangle. We prove the existence of infinitely many periodic points accumulating at infinity. To do so we construct a return map from a strip into itself and we study its properties. We also show some numerical simulations which, in particular, display heteroclinic intersections and Smale's horseshoes.

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Key words: Outer billiard, periodic orbit, dynamical system, planar geometry, homoclinic intersection, Smale's horseshoe.