Mathematical Physics

Hamiltonian motions of plane curves and formation of singularities and bubbles

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A class of Hamiltonian deformations of plane curves is defined and studied. Hamiltonian deformations of conics and cubics are considered as illustrative examples. These deformations are described by systems of hydrodynamical type equations. It is shown that solutions of these systems describe processes of formation of singularities (cusps, nodes), bubbles, and change of genus of a curve.

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