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**Solution of nonlinearly curvature driven evolution of plane curves.** (English) Zbl 0938.65145  
Appl. Numer. Math. 31, No. 2, 191-207 (1999).

Authors' abstract: The evolution of plane curves obeying the equation  $v = \beta(k)$ , where  $v$  is normal velocity and  $k$  curvature of the curve is studied. Morphological image and shape multiscale analysis of *L. Alvarez, F. Guichard, P.-L. Lions* and *J.-M. Morel* [Axioms and fundamental equations of image processing, Arch. Ration. Mech. Anal. 123, No. 3, 199-257 (1993; [Zbl 0788.68153](#))] and affine invariant scale space of curves introduced by *G. Sapiro* and *A. Tannenbaum* [J. Funct. Anal. 119, No. 1, 79-120 (1994; [Zbl 0801.53008](#))] as well as isotropic motions of plane phase interfaces studied by *S. B. Angenent* and *M. E. Gurtin* [Multiphase thermomechanics with an interfacial structure. II: Evolution of an isothermal interface, Arch. Rat. Mech. Anal. 108, 323-391 (1989); J. Reine Angew. Math. 446, 1-47 (1994; [Zbl 0784.35124](#))] are included in the model. We introduce and analyze a numerical scheme for solving the governing equation and present numerical experiments.

Reviewer: [R.Gorenflo \(Berlin\)](#)

**MSC:**

- [65P10](#) Numerical methods for Hamiltonian systems including symplectic integrators
- [37C10](#) Dynamics induced by flows and semiflows
- [65M20](#) Method of lines for initial value and initial-boundary value problems involving PDEs
- [35K05](#) Heat equation

Cited in 4 Documents

**Keywords:**

curve evolution; image and shape multiscale analysis; phase interface; nonlinear degenerate parabolic equations; numerical experiments

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