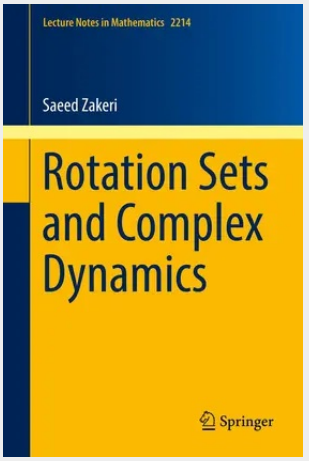
Zakeri

Rotation Sets and Complex Dynamics



This monograph examines rotation sets under the multiplication by *d* (mod 1) map and their relation to degree d polynomial maps of the complex plane. These sets are higher-degree analogs of the corresponding sets under the angle-doubling map of the circle, which played a key role in Douady and Hubbard's work on the quadratic family and the Mandelbrot set. Presenting the first systematic study of rotation sets, treating both rational and irrational cases in a unified fashion, the text includes several new results on their structure, their gap dynamics, maximal and minimal sets, rigidity, and continuous dependence on parameters. This abstract material is supplemented by concrete examples which explain how rotation sets arise in the dynamical plane of complex polynomial maps and how suitable parameter spaces of such polynomials provide a complete catalog of all such sets of a given degree. As a main illustration, the link between rotation sets of degree 3 and one-dimensional families of cubic polynomials with a persistent indifferent fixed point is outlined.

The monograph will benefit graduate students as well as researchers in the area of holomorphic dynamics and related fields.

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