

The Slope Problem in Discrete Iteration

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Abstract: In the setting of non-elliptic continuous semigroups of holomorphic self-maps, the Slope Problem aims to determine the directions through which trajectories converge to the corresponding Denjoy–Wolff point. As it is usual in the area, the answer to this problem depends on the nature of the semigroup, that is, whether it is hyperbolic, parabolic of positive hyperbolic step or parabolic of zero hyperbolic step. After the contribution of several people (D. Betsakos, F. Bracci, M. D. Contreras, S. Díaz Madrigal, H. Gaussier, M. Elin, P. Gumenyuk, G. Kelgiannis, S. Shoikhet, A. Zimmer, ...), the problem is considered to be solved in terms of these dynamical properties.

This problem has a natural counterpart in the theory of Discrete Iteration, although it is not possible to find as many references as in the latter case. There are classical contributions due to J. Wolff, G. Valiron and C. Pommerenke, and some recent ones by F. Bracci and P. Poggi-Corradini, but surprisingly there are questions that remain open (even if they are solved in the continuous setting).

In this talk, the Slope Problem in the discrete setting will be presented to the audience. We will communicate some advances concerning the slope of parabolic functions of zero hyperbolic step, which will be linked to the continuous theory. We will also discuss the Slope Problem for a family of parabolic functions that has been considered previously in the literature, known as the angular class of second order.

This is a joint work with Manuel D. Contreras (Universidad de Sevilla) and Luis Rodríguez-Piazza (Universidad de Sevilla).