FINGERS IN THE PARAMETER SPACE OF THE COMPLEX STANDARD FAMILY

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We study the parameter space of the complex standard family

$$F_{\alpha,\beta}(z) = z + \alpha + \beta \sin z,$$

where the parameter $0 < \beta \ll 1$ is considered to be fixed and the bifurcation is studied with respect to the parameter $\alpha \in \mathbb{C}$. In the real axis of that parameter plane one can observe the so-called Arnold tongues, and from them arise some finger-like structures which were observed for the first time by Fagella in her PhD thesis. Similar structures can also be observed in the parameter spaces of families of Blaschke products or Henon maps in higher dimension. We study the qualitative and quantitative aspects of the fingers via parabolic bifurcation. This is a work in progress joint with Mitsuhiro Shishikura (Kyoto University).