Experimental and theoretical study of pattern identification in physical systems on circular domains RORY HARTONG-REDDEN, Northwestern University, ROUSLAN KRECHETNIKOV, University of California at Santa Barbara — This study is motivated by a recent finding of systems in the context of fluid dynamics (e.g. drop splash phenomena) where instabilities of different wavenumbers may co-exist and thus lead to several single-wavenumber patterns superimposed with random phase-shifts between them. A new experimental setup of stereo high-speed photography enables accurate data acquisition of these patterns. However, identification of the wavenumber structure of such patterns from experimental data is complicated by the lack of a theoretical basis as well as the presence of experimental uncertainties and possible missing points in the data. We present both a new theoretical framework and an example of application – the crown structure analysis in the drop splash problem.

Rouslan Krechetnikov
University of California at Santa Barbara