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Experimental study of a spatiotemporal phase synchronization transition in a 1D-array of nonlocally coupled oscillators[1] MONTSERRAT ANA MIRANDA, JAVIER BURGUETE, University of Navarra — We report the first experimental evidence in hydrodynamics of a phase synchronization transition between 80 nonlocally coupled convective oscillators. The initial pattern corresponds to a spatiotemporal chaotic regime of irregular clusters which becomes unstable by increasing the vertical temperature difference. Further beyond, a robust pattern emerges with two large localized stationary clusters. We show that oscillators belonging to these stationary clusters have become synchronized through a supercritical bifurcation. The antiphase cross-correlations define surfaces of synchronized oscillators, we study how the interaction range between the initially nonlocally coupled oscillators increases as we cross quasi-statically the threshold of this bifurcation.

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