

CHIMERAS IN SQUID METAMATERIALS

N. Lazarides^{1,2*}, G. Neofotistos¹, G. P. Tsironis^{1,2,3}

1) Crete Center for Quantum Complexity and Nanotechnology, Department of Physics, University of Crete, Heraklion, Greece; *nl@physics.uoc.gr; 2) Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas, Heraklion, Greece; 3) School of Science and Technology, Nazarbayev University, Astana, Kazakhstan

Non-locally coupled, periodically arranged SQUIDs (Superconducting QUantum Interference Devices) can form magnetic metamaterials exhibiting extraordinary properties, including tuneability and dynamic multistability, which have been experimentally observed. It is demonstrated numerically that they also exhibit complex dynamic states in which clusters of SQUIDs with synchronous dynamics coexist with clusters that exhibit asynchronous behavior. These "chimera states" appear generically as a result of the non-local, dipole-dipole magnetic coupling between SQUIDs, and they can be reached by randomly initializing the system. They also affect measurable quantities and thus their presence can in principle be detected with presently available experimental set-ups.

References.

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