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Chimera States in a Hodgkin-Huxley Model of Thermally Sensitive Neurons TERA GLAZE, SCOTT LEWIS, University of Missouri at St. Louis, KENNETH SHOWALTER, West Virginia University, SONYA BAHAR, University of Missouri at St. Louis — Chimera states, in which identically coupled groups of nonlinear oscillators exhibit very different dynamics, with one group performing synchronized oscillations and the other group showing desynchronized behavior, have recently been studied in computational models. Chimera states have also been demonstrated experimentally in optical and chemical systems. The behavior is particularly relevant in the context of neural synchronization, given the phenomenon of unihemispheric sleep in many animal species, including some mammals, and the recent observation of asymmetric sleep in human patients with sleep apnea. Here, we characterize chimera states using the Huber-Braun neural model, a Hodgkin-Huxley-like model of thermally sensitive neurons. We identify parameter regimes which exhibit chimera behavior and phase cluster states, both in a system with Abrams-Strogatz (mean field) coupling and in a system with Kuramoto (distance-dependent) coupling.

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