

# The Total s-Energy of a Multiagent System

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We introduce the "total s-energy" of a multiagent system and bound its maximum asymptotic value. This offers a new analytical lens on bidirectional agreement dynamics. We use our results to bound the convergence rates of dynamical systems for synchronization, flocking, opinion dynamics, and social epistemology.

Subjects: **Adaptation and Self-Organizing Systems (nlin.AO)**; Multiagent Systems (cs.MA); Optimization and Control (math.OC)

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