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Locally Minimal Energy States in Social Networks

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A social network in which everybody knows everyone else can be represented by a complete graph whose nodes represent persons. A sign is associated to each edge; a + sign means the persons are friends and a - sign means the persons are enemies. A 3-cycle (triangle) is called balanced if the product of its edge sign is positive and unbalanced otherwise. A “jammed state” is a sign arrangement such that negating the sign of any edge in the graph does not reduce the number of unbalanced triangles; that is, it is a local minimum for the number of unbalanced triangles. Jammed states with unbalanced triangles have important implications for the development of the social network. I will present some recent results on the properties of these jammed states.
