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Evolution of opinions on social networks in the presence of competing committed groups SAMEET SREENIVASAN, Dept. of Computer Science, Dept. of Physics, Rensselaer Polytechnic Institute, JIERUI XIE, BOLESLAW SZYMANSKI, Dept. of Computer Science, Rensselaer Polytechnic Institute, JEFF EMENHEISER, MATT KIRBY, GYORGY KORNISS, Dept. of Physics, Rensselaer Polytechnic Institute — Using a model of pairwise social influence, the *binary agreement* model (Xie et. al, Phys. Rev. E 84, 011130 (2011)), we study how the presence of two groups of individuals committed to competing opinions, affect the steady-state opinion of influencable individuals on a social network. We assume that two groups committed to distinct opinions A and B, and constituting fractions p_A, p_B of the total population respectively, are present in the network. We show using mean-field theory that the phase diagram of this system in parameter space (p_A, p_B) consists of two regions, one where two stable steady-states coexist, and the remaining where only a single stable steady-state exists. For finite networks (complete graphs, Erdős-Rényi networks and Barabási-Albert networks), these two regions are separated by two first order transition lines which terminate and meet tangentially at $p_A = p_B \approx 0.1623$, which constitutes a second-order transition point. Finally, we quantify how the exponentially large switching times between steady states in the co-existence region depend on the distance from the second-order transition point for equal committed fractions.

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