

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Dynamics of influence and social balance in spatially-embedded regular and random networks**<sup>1</sup> P. SINGH, S. SREENIVASAN, B. SZYMANSKI, G. KORNISS, RPI — Structural balance - the tendency of social relationship triads to prefer specific states of polarity - can be a fundamental driver of beliefs, behavior, and attitudes on social networks. Here we study how structural balance affects deradicalization in an otherwise polarized population of leftists and rightists constituting the nodes of a low-dimensional social network. Specifically, assuming an externally moderating influence that converts leftists or rightists to centrists with probability  $p$ , we study the critical value  $p = p_c$ , below which the presence of metastable mixed population states exponentially delay the achievement of centrist consensus. Above the critical value, centrist consensus is the only fixed point. Complementing our previously shown results for complete graphs, we present results for the process on low-dimensional networks, and show that the low-dimensional embedding of the underlying network significantly affects the critical value of probability  $p$ . Intriguingly, on low-dimensional networks, the critical value  $p_c$  can show non-monotonicity as the dimensionality of the network is varied. We conclude by analyzing the scaling behavior of temporal variation of unbalanced triad density in the network for different low-dimensional network topologies.

<sup>1</sup>Supported in part by ARL NS-CTA, ONR, and ARO

P. Singh  
RPI

Date submitted: 14 Nov 2014

Electronic form version 1.4