Non-trivial Correlations in a Model of Extreme Introverts Extroverts[1] MOHAMMADMEHDI EZZATABADIPOUR, KEVIN E. BASSLER, Department of Physics, University of Houston, R.K.P. ZIA, Center for Soft Matter and Biological Physics, Physics Department, Virginia Tech, Blacksburg — Recent studies showed that the XIE model of extreme introverts and extroverts display remarkable collective properties (JSTAT P07013, 2015). A configuration of this evolving stochastic system, the cross-links between the two groups, is uniquely specified by an incidence matrix: $n_{ij}(= 0, 1)$. Regarding this system as an Ising lattice gas, the stationary distribution was found exactly and can be interpreted as $exp(-H)$, with long-range, multi- spin interactions in H. Though extraordinary <u>correlations</u> between the ns can be expected, the underlying permutation symmetries obscure our intuition. Using computer simulations, we study these correlations in detail, contrasting them with those in random ensembles of bipartite graphs. One surprise is that links connecting two distinct pairs of introverts and extroverts are anti-correlated. We also measure degree distributions of the two groups, as well as the distribution of the total number of cross-links, and relate them to various correlations, finding excellent agreement between simulations and theory. Finally, a self-consistent mean field approach is formulated, which can predict the distributions and so, the correlations.

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