Statistics of interacting networks with extreme preferred degrees: Simulation results and theoretical approaches[1] WENJIA LIU, BEATE SCHMITTMANN, R.K.P. ZIA, Virginia Tech Physics Dept — Network studies have played a central role for understanding many systems in nature - e.g., physical, biological, and social. So far, much of the focus has been the statistics of networks in isolation. Yet, many networks in the world are coupled to each other. Recently, we considered this issue, in the context of two interacting social networks. In particular, We studied networks with two different preferred degrees, modeling, say, introverts vs. extroverts, with a variety of "rules for engagement." As a first step towards an analytically accessible theory, we restrict our attention to an "extreme scenario": The introverts prefer zero contacts while the extroverts like to befriend everyone in the society. In this "maximally frustrated" system, the degree distributions, as well as the statistics of cross-links (between the two groups), can depend sensitively on how a node (individual) creates/breaks its connections. The simulation results can be reasonably well understood in terms of an approximate theory.

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