

# Abstract for GR-TR Conference on Statistical Mechanics and Dynamical Systems

Topic: Complex Networks

Preference: Oral

## Motif statistics and dynamics on Boolean Networks

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We have developed a modified version of Boolean Kauffmann nets[1], using Boolean masks [2] at the nodes, rather than random Boolean functions. A population of small networks with 7 nodes were evolved under the genetic algorithm [3], holding the degree of the nodes fixed, and with the cost function being defined as the length of the attractor of the dynamics. The evolved population exhibits an excess of linear (loopless) three-motifs [4] relative to a random set of networks with the same number of nodes and edges. The role which this over-represented set of motifs play in the stability properties of the networks is investigated. The properties of the Laplace spectra [5, 6, 7] of typical networks with short periodic attractors vs those exhibiting chaotic behaviour are catalogued.

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