1038-94-203   **Shayne Michael Vargo*** (`shaynevargo@webtv.net`), 11315 Middle Ridge Terrace, San Diego, CA 92128. *Convergences of the Sum-Product Algorithm on Some Small Multi-Edged Graphs.* Preliminary report.

The sum-product algorithm is known to work well for decoding certain classes of codes, especially LDPC codes, and yet we understand little about its behavior on some of the simplest of graphs. In this talk, we will try to better understand the algorithm by applying it to some small connected bipartite graphs. In particular, we will consider graphs with a small fixed number of nodes and will examine the effect of varying the number of edges. By treating the updates of the algorithm as dynamical systems, we are able to derive exact convergence results for some simple cases and will provide strong evidence of similar results for some more complicated graphs. (Received February 10, 2008)