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Lucas J Rusnak* (Lucas.Rusnak@txstate.edu), Texas State University, San Marcos, TX 78666, and **Nathan Reff** (reff@math.binghamton.edu), Binghamton University, Binghamton, NY 13902. *An oriented hypergraphic approach to algebraic graph theory.*

Oriented hypergraphs are an oriented incidence structure that extends the concepts of graphs and signed graphs. We demonstrate that the ij^{th} entry of the signed adjacency matrix of an oriented hypergraph is the aggregate number of signed vertex-walks between vertices v_i and v_j . We also show that the Laplacian matrix of an oriented hypergraph, which is the difference of its degree and signed adjacency matrices, is also the product of its incidence matrix and its transpose. Moreover, the familiar line graph results can be replaced by incidence duality. Finally, we discuss a direct combinatorial interpretation of the entries of the Laplacian using the concept of *signed weak walks*. (Received September 04, 2011)