1077-VJ-2586 **Franklin H.J. Kenter*** (fkenter@math.ucsd.edu), 9500 Gilman Drive, Dept. of Mathematics MC 0112, La Jolla, CA 92093. *Necessary Spectral Conditions for 2-coloring Regular 3-uniform Hypergraphs.*

Hoffman proved that for a simple graph G, the chromatic number, $\chi(G)$, obeys $\chi(G) \leq 1 - \frac{\lambda_1}{\lambda_n}$ where λ_1 and λ_n are the maximal and minimal eigenvalues of the adjacency matrix of G respectively. Lovász later showed that $\chi(G) \leq 1 - \frac{\lambda_1}{\lambda_n}$ for any (perhaps negatively) weighted adjacency matrix.

We give a short probabilistic proof of Lovász's theorem. We then extend the technique to derive generalizations of Hoffman's theorem for regular graphs regarding colorings allowing a certain proportion of edge-conflicts. Finally, we derive our main result: If a d-regular 3-uniform hypergraph is 2-colorable, then $-\lambda_{min} \geq \frac{2d}{3}$ where λ_{min} is the smallest eigenvalue of an appropriately-weighted adjacency matrix for the underlying graph. (Received September 23, 2011)