1059-05-27 **Sarah C Rundell*** (crowns@denison.edu), Dept. of Mathematics and Computer Science, Denison University, Granville, OH 43023, and **Jane H Long**. *The Hodge Structure of the Coloring Complex of a Hypergraph.*

Let G be a simple graph with n vertices. The coloring complex $\Delta(G)$ was defined by Steingrímsson, and the homology of $\Delta(G)$ was shown to be nonzero only in dimension $n-3$ by Jonsson. Hanlon recently showed that the Eulerian idempotents provide a decomposition of the homology group $H_{n-3}(\Delta(G))$ where the dimension of the j^{th} component in the decomposition, $H_{n-3}^{(j)}(\Delta(G))$, equals the absolute value of the coefficient of λ^j in the chromatic polynomial of G, $\chi_G(\lambda)$.

Let H be a hypergraph with n vertices. In this talk, we will define the coloring complex of a hypergraph, $\Delta(H)$, and show that the coefficient of λ^j in $\chi_H(\lambda)$ gives the Euler Characteristic of the j^{th} Hodge subcomplex of the Hodge decomposition of $\Delta(H)$. We also examine conditions on a hypergraph, H, for which its Hodge subcomplexes have the homology of a wedge of spheres, and thus where the absolute value of the coefficient of λ^j in $\chi_H(\lambda)$ equals the dimension of the j^{th} Hodge piece of the Hodge decomposition of $\Delta(H)$. (Received February 03, 2010)