Colleen Duffy* (duffycm@uwec.edu), University of Wisconsin - Eau Claire, Department of Mathematics - Hibbard Hall, Eau Claire, WI 54701. Action of the symmetry group of the n-dimensional hypercube on the algebra associated to the Hasse graph of the n-cube. Preliminary report.

It is interesting to study the structure of (graded) algebras associated to directed graphs. There is an algebra $A(\Gamma_{\{4,3n-2\}})$ associated to the directed Hasse graph $\Gamma_{\{4,3n-2\}}$ of the n-dimensional hypercube. Let $E$ be the set of edges in the graph and let $P_\pi(t) = (1 - te_1) \cdots (1 - te_m)$ for any directed path $\pi = \{e_1, ..., e_m : e_i \in E\}$ in $\Gamma_{\{4,3n-2\}}$. Then $A(\Gamma_{\{4,3n-2\}})$ is the quotient of the free algebra $T(E)$ by the relations given by $P_{\pi_1}(t) = P_{\pi_2}(t)$ where $\pi_1$ and $\pi_2$ have the same initial and final vertices. The symmetry group of the n-dimensional hypercube, which is the Coxeter group $[4,3n-2]$, acts naturally on $\Gamma_{\{4,3n-2\}}$, and so on each of the homogeneous subspaces $A(\Gamma_{\{4,3n-2\}})[i]$ of $A(\Gamma_{\{4,3n-2\}})$. For each element $(\sigma, \vec{a})$ in the Coxeter group, we find the graded trace function $\text{Tr}_{(\sigma, \vec{a})} = \sum_{i \geq 0} \text{Tr}_{(\sigma, \vec{a})} | A(\Gamma_{\{4,3n-2\}})[i] | t^i$. We use these graded trace generating functions to obtain the multiplicities of the irreducible $[4,3n-2]$-modules in $A(\Gamma_{\{4,3n-2\}})[i]$. (Received September 22, 2009)