

1112-16-643

**Sarah R. Bockting-Conrad\*** (sbocktin@depaul.edu). *Some  $q$ -exponential formulas involving the double lowering operator  $\psi$  for a tridiagonal pair.* Preliminary report.

Let  $\mathbb{K}$  denote an algebraically closed field and let  $V$  denote a vector space over  $\mathbb{K}$  with finite positive dimension. In this talk, we consider a tridiagonal pair  $A, A^*$  on  $V$  which has  $q$ -Racah type. We will introduce the linear transformations  $\psi : V \rightarrow V$ ,  $\Delta : V \rightarrow V$ , and  $\mathcal{M} : V \rightarrow V$ , each of which acts on the split decompositions of  $V$  in an attractive way. We will show that  $\Delta$  can be factored into a  $q^{-1}$ -exponential in  $\psi$  times a  $q$ -exponential in  $\psi$ . We view  $\Delta$  as a transition matrix from the first split decomposition of  $V$  to the second. Consequently, we view the  $q^{-1}$ -exponential in  $\psi$  as a transition matrix from the first split decomposition to a decomposition of  $V$  which we interpret as a kind of half-way point. This half-way point turns out to be the eigenspace decomposition of  $\mathcal{M}$ . We will discuss the eigenspace decomposition of  $\mathcal{M}$  and give the actions of various operators on this decomposition. (Received August 11, 2015)