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**Darlayne Addabbo\*** (addabbo2@illinois.edu). *Q-systems and Generalizations in Representation Theory.*

Certain tau functions for the Toda lattice are solutions to a discrete integrable system called a Q-system. These tau functions can be written as matrix elements for the basic representation of  $\widehat{sl}_2$ , the universal central extension of the loop algebra of  $sl_2$ , on fermionic Fock space. It is then natural to ask what sort of discrete equations are satisfied by analogous tau functions written as matrix elements for the basic representation of  $\widehat{sl}_3$ . Since Q-systems appear in many places in representation theory, we hope that these new discrete equations satisfied by our  $\widehat{sl}_3$  tau functions will also have interesting applications. We will discuss this new system of equations as well as the progress we have made in exploring its applications. (Joint work with M. Bergvelt) (Received January 15, 2016)