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Q-systems and Generalizations in Representation Theory.

In this talk, we will define tau-functions given as matrix elements for the action of \widehat{GL}_n on n -component Fermionic Fock space. We will explain how to show that the tau-functions for the $n = 2$ case satisfy the $A_{\infty/2}$ Q -system. Since Q -systems are of interest in various places in mathematics, for example in combinatorics and in representation theory, it is natural to expect that the tau-functions for the $n > 2$ cases also satisfy interesting systems of difference equations. We will discuss the difference equations satisfied by the $n = 3$ tau-functions and will give conjectures for the general n case. We will conclude the talk by discussing the progress we have made in analyzing these systems of equations. If time permits, a generalization of this work will be discussed. (Joint with Maarten Bergvelt) (Received January 16, 2017)