1106-34-198 **Xuewei Jiang*** (xuewei_jiang@baylor.edu), Baylor University, Waco, TX 76798.
Differentiation with Respect to Parameters of Solutions of Nonlocal Boundary Value Problems for Difference Equations.

For the nth order difference equation, $\Delta^n u = f(t, u, \Delta u, ..., \Delta^{n-1}u, \lambda)$, the solution of the boundary value problem satisfying $\Delta^{i-1}u(t_0) = A_i, 1 \leq i \leq n-1$, and $u(t_1) - \sum_{j=1}^{m} a_j u(\tau_j) = A_n$, where $t_0, \tau_1, \ldots, \tau_m, t_1 \in \mathbb{Z}$, $t_0 < \cdots < t_0 + n - 1 < \tau_1 < \cdots < \tau_m < t_1$, and $a_1, \ldots, a_m, A_1, \ldots, A_n \in \mathbb{R}$, is differentiated with respect to the parameter λ. This talk will discuss the new theorem we proved that $\frac{\partial u}{\partial \lambda}$ exists on $[t_0, +\infty)_{\mathbb{Z}}$, and $w(t) := \frac{\partial u}{\partial \lambda}(t)$ is the solution of the nonhomogeneous linear equation, $\Delta^n z = \sum_{i=1}^{n} \frac{\partial f}{\partial s_i}(t, u(t), \ldots, \Delta^{n-1}u(t), \lambda)\Delta^{i-1}z + \frac{\partial f}{\partial \lambda}(t, u(t), \ldots, \Delta^{n-1}u(t), \lambda)$, along $u(t)$ and satisfies $\Delta^{i-1}w(t_0) = 0,\ 1 \leq i \leq n-1$, and $w(t_1) - \sum_{j=1}^{m} a_j w(\tau_j) = 0$. (Received August 08, 2014)