

1096-33-1780

Jessica D. Stewart* (jessica_stewart@baylor.edu), One Bear Place #97328, Waco, TX 76798-7328, and **Lance L. Littlejohn** and **Constanze Liaw**. *The Spectral Analysis of the Exceptional Jacobi Differential Expression for Extreme Parameter Choices*.

In 2009, Gómez-Ullate, Kamran, and Milson characterized all sequences of polynomials $\{p_n\}_{n=1}^{\infty}$, with $\deg p_n = n \geq 1$, that are eigenfunctions of a second-order differential equation and are orthogonal with respect to a positive Borel measure on the real line having finite moments of all orders. Up to a complex linear change of variable, the only such sequences are the X_1 -Laguerre and the X_1 -Jacobi polynomials. In this talk, I will discuss the X_1 -Jacobi differential expression $\ell_{\alpha,\beta}$ for the extreme parameter choice of $\alpha = 0$ which corresponds to the non-classical Jacobi expression with $\alpha = -2$. The self-adjoint operator associated with $\ell_{\alpha,\beta}$ and these extreme parameter choices can be studied in two spaces—one of which falls into the classical Glazman, Krein, Naimark theory; the other applies the left-definite theory introduced by Littlejohn and Wellman. In each case, the operator will have a complete set of [orthogonal] eigenfunctions. (Received September 16, 2013)