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Jessica D. Stewart* (jessica.stewart@goucher.edu), 1021 Dulaney Valley Road, Baltimore, MD 21204. *A Third Type of Exceptional Laguerre Polynomials*. Preliminary report.

In 2009, Gómez-Ullate, Kamran, and Milson extended the well-established Bochner Classification (1929) by showing that the only polynomial sequences $\{p_n\}_{n=1}^{\infty}$ which simultaneously form a complete set of eigenstates for a second-order differential operator and are orthogonal with respect to a positive Borel measure having positive moments are the exceptional X_1 -Laguerre and X_1 -Jacobi polynomials. Since then, the result has been further extended to study other exceptional orthogonal polynomials $\{p_n\}_{n \in \mathbb{N}_0 \setminus A}$ where A is a finite subset of \mathbb{N}_0 and where $\deg p_n = n$ for all $n \in \mathbb{N}_0 \setminus A$. Sequences of this nature are referred to as exceptional X_m sequences, where $m = |A|$. Remarkably, even in this more general setting, the sequences remain complete in their corresponding Hilbert space setting. There are two established types of exceptional X_m -Laguerre polynomial sequences. Here we will address a third type of X_m -Laguerre sequence. In particular, we will discuss the relationship of this new Type III sequence to the Type I exceptional X_m -Laguerre polynomials, along with orthogonality, norms, local extrema, and location of roots. (Received September 16, 2014)