Some characterization problems related to d-orthogonal polynomial sets

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Abstract: The notion of d-orthogonal polynomials is a generalization of the notion of orthogonality in the sense that the polynomials P_n, $n = 0, 1, \ldots$ satisfy orthogonality conditions with respect to d forms. d-orthogonal polynomials are characterized by a higher-order recurrence relation of the form

$$P_{n+1}(x) = (x + \alpha_{n+1})P_n(x) + \sum_{k=0}^{d} \binom{n}{k} \beta_k^{(n+1)} P_{n-k}(x),\ \beta_d^{(n+1)} \neq 0\ n \geq 0.$$

We are interested, in this talk, with some characterization problems for d-orthogonal polynomial sequences when they satisfy additional properties. Indeed

- d-orthogonal polynomials of Sheffer type.

- Symmetric d-orthogonal polynomials of Sheffer type.

- Classical discrete d-orthogonal polynomials.