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The Discrete Sheffer Sequences and Schrodinger Form.

In this talk, I develop a discrete analogue of the one-dimensional time-independent Schrodinger equation through the theory of classical discrete orthogonal polynomial sequences. The difference equation is first established in a general context and then specific solutions are obtained involving each of the discrete Sheffer sequences (the Meixner, Charlier and Krawtchouk polynomials). In turn, I also develop a first-order difference equation for each of these polynomials; the derivation of the latter two does not appear in the literature. Finally, I supplement my analysis by graphing several solutions to the Schrodinger equation and conclude my talk with some future directions. (Received September 20, 2016)