1116-33-947 **Vincent X Genest** and **Luc Vinet*** (vinet@crm.umontreal.ca), Centre de Recherches Mathématiques, Université de Montréal, C.P. 6128, Succursale Centre-ville, Montréal, Québec H3C 3J7, Canada, and **Alexei Zhedanov**. *Fractional Revival in Spin Chains and Orthogonal Polynomials.*

The couplings and magnetic fields of XX spin chains with nearest neighbor interactions correspond to the recurrence coefficients of orthogonal polynomials. Fractional revival (FR) occurs in a quantum system when an initial wave packet evolves into small clones that recur with periodicities in a localized fashion. This phenomenon can be observed in spin chains and put to use to perform tasks such as quantum information transfer or the generation of entangled states. The special case where the wave packet is reproduced at only one site is referred to as perfect state transfer (PST). There are two basic ways to engineer chains with FR and the connection in each case to orthogonal polynomials will be discussed. The first method naturally brings in the para Krawtchouk polynomials that are orthogonal on linear bi-lattices. The second mechanism involves performing an isospectral transformation of the persymmetric Jacobi matrix associated to chains with PST and leads to polynomials that also have interesting properties. (Received September 15, 2015)