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Bi-orthogonal quantum systems THOMAS CURTRIGHT, LUCA MEZINCESCU, ANDREJ PEREZ-VEITIA, DAVID SCHUSTER, University of Miami — Models of PT symmetric quantum mechanics provide examples of bi-orthogonal quantum systems. The latter incorporporate all the structure of PT symmetric models, and allow for generalizations, especially in situations where the PT construction of the dual space fails. This happens for periodic solutions that occur at spectral singularities. For these periodic solutions, the dual functions are associated polynomials that obey inhomogeneous equations. The formalism is illustrated by a few exact results for some elementary potential models. In some non-trivial cases, equivalent hermitian theories are obtained and shown to be very simple: They are just free (chiral) particles. Field theory extensions are briefly considered. Supersymmetric bi-orthogonal systems are also discussed.

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