This is a review submitted to Mathematical Reviews/MathSciNet.

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Title: Enhanced classification of matrix superpotentials.

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Review text:

Although the costly experiments performed on gigantic accelerators did not confirm the predicted presence of supersymmetry (i.e., of certain correspondence between fermions and bosons) in nature, the underlying mathematical idea itself survived and found its second life in the theory as well as in the applications of ordinary linear differential equations. Its use contributed, first of all, to the study of solvable Schrödinger equations describing a point particle confined by a one-dimensional shape-invariant potential (cf. review [2]). The formalism (not unrelated to the theory of Darboux transformations and non-linear Riccati equations) made the classification of these potentials transparent. The present paper contributes to the current effort aimed at the extension of this classification to the coupled systems of Schrödinger equations (or, if you wish, to the solvable models of confined particles with spin, etc). In a continued development and partial completion of the results of their last-year paper [17], the authors base their classification on the so called superpotentials (= the concept related, roughly speaking, to the logarithmic derivative of the ground-state wavefunction in the scalar case). Due attention is paid to the applicability of these results to the (separable cases of) motion in more dimensions and to the detailed description of the solvable shape-invariant models using two coupled equations (where the authors arrive at a complete classification) and 3 coupled equations.