This is a review submitted to Mathematical Reviews/MathSciNet.

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Author: Batic, D.; Williams, R.; Nowakowski, M.

Title: Potentials of the Heun class.

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Review text:

Multiple ordinary differential Schródinger equations are called "solvable" whenever they can be made equivalent, via a closed-form change of variables, to the Gauss' (or confluent) hypergeometric equation. A review provided in the first half of the paper is complemented by the study of analogous mappings between one-dimensional quantum models and the Heun ordinary differential equation including also its confluent and generalized cases. These mappings are of a generalized Natanzon type since in a preparatory step an auxiliary nonlinear differential equation defines an auxiliary function $y(x)$ of the coordinate x. The potential itself is ultimately determined as a specific rational function of y while the coordinate itself is only available in an implicit form of inverse function $x = x(y)$.