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Review text:

Title tells all. The text inspired by Calogero is well tuned to his special birthday issue. Review-like recommended reading for all who love both the S. Lie's symmetries-employing approach to differential equations and quantum theory. This time, the key motivation seems to be the fascination by the latter, with shared (and inspiring) characteristic of the three analyzed examples (for which, basically, solutions are being derived and discussed) being the presence of a strong singularity in the origin (which is, by my opinion, one of the best textbook problems popularized by the presence of the centrifugal term in radial Schroedinger equations, well understood via the mathematical Hilbert-space-operator theory of self-adjoint extensions and revitalized recently in the so called PT-symmetric analytic-continuation context). The authors show, compactly and very nicely, how this type of singularities lives its independent life in the Liean solution-generating context.