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Invariants and invariant description of second-order ODEs with three infinitesimal symmetries. II

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Abstract

The second-order ordinary differential equations can have one, two, three or eight independent symmetries. Sophus Lie showed that the equations with eight symmetries and only these equations can be linearized by a change of variables. Moreover he demonstrated that these equations are at most cubic in the first derivative and gave a convenient invariant description of all linearizable equations. We provide a similar description of the equations with three symmetries. There are four different types of such equations. Classes of equations equivalent to one of these equations were studied in [Ibragimov NH, Meleshko SV. Invariants and invariant description of second-order ODEs with three infinitesimal symmetries. *Communication in Nonlinear Science and Numerical Simulation*, in press], where we presented the candidates for all four types and studied one of these candidates. The present paper is the continuation of the work of Ibragimov and Meleshko and is devoted to other three candidates.

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