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Pavel Winternitz* (wintern@crm.umontreal.ca), Centre de recherches mathematiques,
Universite de Montreal, C.P.6128-CV, Montreal, Quebec H3C 3J7, Canada. *Lie point symmetries
and numerical solutions of differential equations.*

Lie point symmetries and numerical solutions of differential equations

A method of discretizing ordinary and partial differential equations while preserving their continuous symmetries is presented. By construction the obtained difference equations have the same symmetries as the original difference ones and this dictates many properties of their solution set. On specific examples we show how this type of discretization improves the accuracy of solutions and improves the behaviour of solutions close to singularities. (Received February 09, 2009)