Methods of Solving Flag Partial Differential Equations

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Abstract

Flag partial differential equations naturally appear in geometry, physics and the representation theory of Lie algebras (groups). In this talk, we present the methods of using a higher-order Campbell-Hausdorff formula and Lie algebra grading technique to solve them. In particular, we find a family of new special functions by which we are able to explicitly give the solutions of the initial value problems of a large family of constant-coefficient linear partial differential equations in terms of coefficients.