

*Phi-order condition and stiffness resilient exponential
integrators*

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In this talk, we introduce a new theoretical framework for deriving exponential methods. This framework addresses the complexity of deriving exponential schemes and enforces advantageous properties. We show that the dominant error terms of stiff problems are canceled for the methods derived with this framework. This has the effect of increasing the accuracy of the methods and makes them more resilient to the stiffness of the problem. A wide range of exponential methods can be easily derived using this framework. We present the derivation of high order exponential Runge-Kutta, exponential multi-step, and a new class of exponential multi-values methods.