

High-order accurate methods for fractional differential equations

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Fractional calculus is emerging as a popular tool for the modeling of a variety of problems across the sciences and engineering. However, even though fractional calculus is as old as classic calculus, the development of accurate and efficient computational tools is substantially less advanced in this area.

In this presentation, we first provide some background on fractional calculus, focusing on initial value problems and the problems being particular to such models. We then discuss the development of high-order accurate methods for solving fractional differential equations, illustrated with some examples, and conclude with a brief discussion of some of the many open problems.