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A Graph Approach to Partitioning of ODEs

Abstract

In this work, we present a graph approach to progressive partitioning and there by partitioning a system of ODEs into stiff and nonstiff subsystem. We start of by looking at a system of ODEs and taking advantage of its behavior at the point of instability. The components that are responsible for this instability are brought to the stiff subsystem and vice-versa. Next we define the graph and its characteristics and fit these definitions into stiff ODEs. The advantage is that one can comprehend better, the progressive partitioning technique and able to identify the stiff equations and to write down the step size restriction. A numerical example convinced us on the correctness of the theory and propositions presented