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Qin Sheng* (qin_sheng@baylor.edu), Department of Mathematics, Baylor University, Waco, TX 76798-7328. *Feasible Approximations of Hybrid Dynamic Derivatives on Time Scales*. Preliminary report.

First and second order dynamic derivatives have been playing a central role in the theory and applications of dynamic equations. The equations, built on hybrid domains, that is, time scales, may possess unique capabilities in modeling many important natural phenomena, including the population or epidemic growth with unpredictable jump sizes, energy balance between carbon nano-tubes, and irregular option market estimations. Once a dynamic equation is established, it becomes crucial to approximate the dynamic derivatives involved in a proper way so that solutions of dynamic equations can be obtained on a subset of the time scales considered. The purpose of this preliminary report is to discuss interesting numerical approximations of dynamic derivatives. First and second order non-crossed dynamic derivatives will be targeted. Precise error estimates will be derived and tested. Some numerical experiments will be given. (Received September 24, 2006)