1011-34-55 **Qin Sheng*** (`qin_sheng@baylor.edu`), Department of Mathematics, Baylor University, Waco, TX 76798-7328. *A Continue Discussion about Practical Higher Order Derivative Approximations on Time Scales.* Preliminary report.

Approximations of higher order derivatives have been important issues in solving differential and/or integro-differential equations numerically. The issues have become particularly interesting as hybrid numerical methods are introduced. Such novel numerical methods take advantages of effective adaptive grids, that is, hybrid grids which can be viewed as applications of different time scales. A practically well-defined hybrid grid may possess certain consistency features, such as that both sides of a grid point can only be dense at the same time. In the circumstance, practically meaningful higher order derivative approximations can be derived on time scales. We will explore some most frequently considered dynamic derivatives for such a purpose in this discussion, and then compared them with those conventional approximation formulae. Some numerical examples will be given to illustrate our results. (Received August 09, 2005)

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