1035-65-211 **James H Money*** (`jmoney@nccu.edu`), Townes Science Complex 3249, Department of Mathematics & Computer Science, Durham, NC 27707. *Discretized Picard's Method.*

In 2000, Parker and Sochacki published a paper that describes how to utilize a modifed version of Picard's Method on initial value partial differential equation problems. Their method projects the PDE to a polynomial system and generates the power series approximation to the solution. We will present the Discretized Picard's Method (DPM), which is a hybrid scheme based on the modifed Picard scheme and finite difference approximations. The DPM allows one to generalize a first order method to any order approximation without explicitly computing the difference method in advance. We will show how the DPM relates to forward time difference and Lax-Wendroff schemes. In addition, we present a method for linear discretization schemes and show how to determine the stability condition for any degree approximate. In particular, the stability is increasing as the degree of the approximation increases. We demonstrate several examples based on DPM and how it compares with classical finite difference schemes. (Received August 19, 2007)