Department of Mathematics and Statistics Colloquium

Applying the Parker-Sochacki Method to Space Weather Physics

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Abstract: The Parker-Sochacki (PS) method is applied to physical systems involving a charged particle traveling through various magnetic fields. In each magnetic field used in the study, the method is compared to the Runge-Kutta 4th order in C++. Programming libraries such as OpenMP and the GCC quadmath library are employed to learn about parallel processing and quadruple precision calculations with this algorithm. Adaptive step size with constant order and adaptive order with constant step size is implemented in a reusable framework for all of dynamical systems in the study. Some mathematical simplifications have been discovered that yield useful optimizations for the PS method in various systems.

Monday, April 6 at 3:45 in Roop 103

refreshments at 3:30