1046-65-1351 **Katharine F Gurski*** (kgurski@howard.edu), Department of Mathematics, Howard University, Washington, DC 20059, and **Stephen O'Sullivan**, School of Mathematical Sciences, University College Dublin, Belfield, Dublin 4 , Ireland. *On the stability of a numerical scheme for a system of ordinary differential equations with a large skew-symmetric component.* Preliminary report.

We consider nonlinear systems of ordinary differential equations that may be discretized as $\mathbf{B^{n+1}} = (\mathbf{I} - \mathbf{\Delta t G^n})\,\mathbf{B^n}$. The real matrix $\mathbf{G^n}$ can be decomposed into symmetric, $\mathbf{P}$, and skew-symmetric, $\mathbf{S}$, components. This scheme is stable if the spectral radius $\rho(\mathbf{I} - \mathbf{\Delta t G^n}) < \mathbf{1}$. If the skew component becomes dominant, then the CFL stability condition requires the step size Δt to approach zero.

In this talk we wish to compare the stability of two related families of numerical schemes defined via the reference operators $\mathbf{P}$, $\mathbf{S}$, and the parameter θ $(0 \leq \theta \leq 1)$. The first scheme is $\mathbf{G}'(\theta) = \mathbf{I} - \mathbf{\Delta t}(\mathbf{1} - \theta)\mathbf{P} - \mathbf{\Delta t}\theta\mathbf{S}$ and the second, $\mathbf{H}'(\theta)$, incorporates the predictor-corrector scheme along with multiplicative operator splitting.

We present upper bounds on the CFL condition that show that the time step for the $\mathbf{H}'(\theta)$ is greater or equal to the time step for $\mathbf{G}'(\theta)$ and that $\mathbf{H}'(\theta)$ is stable for $0 \leq \theta \leq 1$ unlike $\mathbf{G}'(\theta)$. (Received September 15, 2008)