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

In this talk we wish to compare the stability of two related families of numerical schemes defined via the reference operators $P$, $S$, and the parameter $\theta$ ($0 \leq \theta \leq 1$). The first scheme is $G'(\theta) = I - \Delta t(1 - \theta)P - \Delta t\theta S$ and the second, $H'(\theta)$, 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 $H'(\theta)$ is greater or equal to the time step for $G'(\theta)$ and that $H'(\theta)$ is stable for $0 \leq \theta \leq 1$ unlike $G'(\theta)$. (Received September 15, 2008)