1056-65-504 **Katharine F. Gurski*** (kgurski@howard.edu), Howard University, Department of Mathematics, Washington, DC 20052, and **Stephen O'Sullivan**, Dublin City University, Ballymun Road, Glasnevin, Dublin, DUBLIN 9, Ireland. *A stability study of a new explicit numerical scheme for a system of differential equations with a large skew-symmetric component.*

Explicit numerical methods for the solution of a system of stiff differential equations suffer from a time step size that approaches zero in order to satisfy stability conditions. Implicit schemes allow a larger time-step, but require more computations. When the differential equations are dominated by a skew-symmetric component, the problem is not stiffness in the sense that the size of the eigenvalues are unequal, rather the that the real eigenvalues are dominated by imaginary eigenvalues. We present and compare analytical results for several explicit methods including the super-time-stepping method of Alexiades, Amiez, and Gremaud which is a explicit Runge-Kutta method and a new method modeled on a predictor-corrector scheme with multiplicative operator splitting. This new explicit method, presented in regular and super-time-stepping form, increases stability without forcing the step size to zero. (Received September 10, 2009)