1023-35-229 **Tamani M Howard*** (tam0we@hotmail.com), TX. *Hyperbolic Monge-Ampère Equation.*

We consider the Monge-Ampère equation, which for a smooth function z on a domain Ω is given by $det(D^2\ z) = f$, where $D^2\ z$ denotes the Hessian of the function z; and f depends on $x,\ y,\ z,\ z_x,\ z_y$. On the domain Ω the equation turns out to be hyperbolic if $f < 0$.

In this paper we use the Sobolev Steepest Descent method introduced by John W. Neuberger to solve the hyperbolic Monge-Ampère equation. First, we use the discrete Sobolev Steepest Descent method to find numerical solutions to $det(D^2\ z) = -g^2$ on $[0,1]^2$ in the two case where $g = 1$ and $g = (1 + z_x^2 + z_y^2)$. We use several initial guesses, and explore the effect of some imposed boundary conditions on the solutions. Finally, we prove convergence of the continuous Sobolev Steepest Descent to show local existence of solutions to the hyperbolic Monge-Ampère equation $det(D^2\ z) = -1$. (Received August 28, 2006)