

Meeting: 1001, Evanston, Illinois, SS 7A, Special Session on Geometric Partial Differential Equations

1001-35-411 **Joseph L Shomberg*** (shomberg@uwm.edu), University of Wisconsin - Milwaukee, Department of Mathematical Sciences, PO Box 413, Milwaukee, WI 53201-0413. *Harmonic Solutions to Some Fully Nonlinear Second Order PDEs on \mathbb{R}^2 .*

Our focus is fully nonlinear second order PDEs in two variables that are expressed as a product of the determinant of the Hessian and a function of the norm of the gradient: $F(D^2u, Du, \mathbf{x}) := \det(D^2u) \Psi(|Du|^2) = f(\mathbf{x})$. With an appropriate radially symmetric function, $f(\mathbf{x}) := R(|\mathbf{x}|)$, we show the existence of up to four families of harmonic solutions to some PDE of the type $\det(D^2u) \Psi(|Du|^2) = R(|\mathbf{x}|)$. Applications to the Monge-Ampère equation and the prescribed Gauss curvature equation are given. (Received August 31, 2004)