Department of Mathematical Sciences
Faculty Sabbatical Presentation

"A Vázquez-type strong minimum principle for weighted partial trace equations"

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Abstract:

An elliptic partial differential equation (PDE) is said to satisfy a strong minimum principle if every non-negative supersolution of the PDE in an open and connected set that vanishes at a point vanishes identically. In a 1984 paper, J. L. Vázquez gave a sufficient condition on the right-hand side of a semilinear equation for the equation to enjoy a strong minimum principle. Subsequently, it was shown that the condition is also necessary.

In this talk, we will identify some sufficient conditions for a weighted partial trace equation with a general Hamiltonian term to satisfy a strong minimum principle. It turns out that these sufficient conditions are also necessary when, in addition, the Hamiltonian is non-increasing in the first variable (for instance when it depends only on the gradient term). If time permits, we will discuss another closely related concept, the so-called compact support principle.