SOME RESULTS FOR VISCOSITY SOLUTIONS TO SOME DOUBLY NONLINEAR DEGENERATE PARABOLIC DIFFERENTIAL EQUATIONS

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Let $\Omega \subset I\!R^n$, be a bounded domain, $0 < T < \infty$ and $\Omega_T = \Omega \times (0, T)$. In this talk we discuss viscosity solutions to two doubly nonlinear equations

$$i) \quad \Delta_\infty u = 3u^2 u_t, \text{ and } ii) \quad \operatorname{div}(|Du|^{p-2}Du) = (p-1)u^{p-2}u_t, \ p \geq 2,$$

in Ω_T. Call P_T the parabolic boundary of Ω_T. Suppose that $h \in C(P_T)$ where $h(x, 0), \ x \in \Omega$ is the initial condition and $h(x, t), \ \partial\Omega \times [0, T)$ is the side condition.

We show that the above p.d.e's (the second one is Trudinger's equation) have unique positive viscosity solutions u when $h > 0$. Existence follows by the use of the Perron method. The talk will describe the sub-solutions and the super-solutions needed to achieve existence.

We also include some results on large time asymptotic behavior and a Phragmen-Lindelof type result.

Joint work with Leonardo Marazzi.