

Some contributions about degenerate parabolic equations

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The first part of the talk will trace the history of the relationship and the past and current cooperation between Ildefonso Díaz and the University of Pau.

The second part of the talk will concern the following quasilinear and singular parabolic equation:

$$\begin{cases} u_t - \Delta_p u = \frac{1}{u^\delta} + f(x, u) & \text{in } (0, T) \times \Omega, \\ u = 0 & \text{on } (0, T) \times \partial\Omega, \quad u > 0 \text{ in } (0, T) \times \Omega, \\ u(0, x) = u_0(x) & \text{in } \Omega, \end{cases} \quad (\text{P}_t)$$

where Ω is an open bounded domain with smooth boundary in \mathbb{R}^N , $1 < p < \infty$, $0 < \delta$ and $T > 0$. We assume that $(x, s) \in \Omega \times \mathbb{R}^+ \rightarrow f(x, s)$ is a bounded below Caratheodory function, locally Lipschitz with respect to s uniformly in $x \in \Omega$ and asymptotically sub-homogeneous.

We present in this talk recent results concerning the following issues:

- 1) existence and uniqueness of weak solutions to (P_t) ,
- 2) regularity of weak solutions to (P_t) ,
- 3) long-time behaviour and stabilization.

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