

# Semilinear Elliptic and Parabolic Inequalities with First Order Terms \*

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We discuss some recent results, obtained jointly with S. I. Pohozaev, concerning instantaneous blow-up of solutions to semilinear parabolic problems of the following type:

$$\begin{cases} \frac{\partial u}{\partial t} - \Delta u \geq \lambda|x|^{-\mu}(x, \nabla u) + |x|^{-\alpha}u^q & \text{in } - \times (0, T) \\ u \geq 0 & \text{in } - \times (0, T). \end{cases} \quad (0.1)$$

Here  $- \subseteq \mathbb{R}^n$ ,  $n \geq 3$  is a bounded smooth domain which contains the origin,  $q > 1$  and  $\lambda, \mu, \alpha$  are real parameters. By  $(\cdot, \cdot)$  we denote the scalar product in  $\mathbb{R}^n$ .

We also investigate the related problem of nonexistence of solutions to semilinear elliptic problems corresponding to (0.1), namely:

$$\begin{cases} -\Delta u \geq \lambda|x|^{-\mu}(x, \nabla u) + |x|^{-\alpha}u^q & \text{in } - \\ u \geq 0 & \text{in } - . \end{cases} \quad (0.2)$$

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