

On some models of epitaxial growth

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We will review some result for the Kadar-Parisi-Zhang model of roughening of surfaces and we will propose some mathematical models arising in the theory of epitaxial growth of crystal. We focalize the study on a stationary problem which presents special analytical difficulties, it is in fact a borderline case. We study the existence of solutions. The central model in this work is given by the following elliptic equation,

$$\Delta^2 u = \det(D^2 u) + \lambda f, \quad x \in \Omega \subset \mathbb{R}^2.$$

The framework to study the problem deeply depends on the boundary conditions.

Some related results and problems will be given.

REFERENCES

B. Abdellaoui, A. Dall'Aglio, I.Peral, *Some Remarks on Elliptic Problems with Critical Growth in the Gradient*, J. Diff. Equations, Vol 222, No 1 (2006) 21-62.

B. Abdellaoui, A. Dall'Aglio, I.Peral, *Regularity and nonuniqueness results for parabolic problems arising in some physical models, having natural growth in the gradient*. J. Math. Pures Appl. 90 (2008) 242-269

Carlos Escudero, Ireneo Peral, *The stationary problem associated to a variational model of epitaxial growth*. preprint.