



# SEMINÁRIO DE EQUAÇÕES DIFERENCIAIS

On the Cauchy problem for the Schrödinger-Debye system in  
critical dimensions

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**Resumo:** We present recent results about the dynamics of the solutions for the Schrödinger-Debye system in dimensions  $N > 1$ . Particularly, in  $L^2$  - critical dimension ( $N = 2$ ) we show that, unlike the cubic NLS (corresponding limiting model), the Schrödinger-Debye system is globally well-posed (without smallness assumption on the initial data) in both cases focusing and defocusing. Finally, we comment new ideas about the formation of singularities in  $H^1$  - critical dimension ( $N = 4$ ). These ideas are based on the viriel type identity for the system.

This is a work in progress in collaboration with J. Drumond Silva (IST/Lisboa).