SEMINÁRIO DE ANÁLISE

A quasi-linear Schrödinger-Poisson system under a critical nonlinearity

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Abstract. In this paper we consider the following quasilinear Schrödinger-Poisson system

$$\begin{cases} -\Delta u + u + \phi u = \lambda f(x, u) + |u|^{2^*-2}u & \text{in } \mathbb{R}^3 \\ -\Delta\phi - \varepsilon^4\Delta_4\phi = u^2 & \text{in } \mathbb{R}^3, \end{cases}$$

depending on the two parameters $\lambda, \varepsilon > 0$.

We first prove that, for λ larger then a certain $\lambda^* > 0$, there exists a solution for every $\varepsilon > 0$. Later, we study the asymptotic behaviour of these solutions whenever ε tends to zero, and we prove that they converge to the solution of the Schrödinger-Poisson system associated.