



SEMINÁRIO DE EQUAÇÕES DIFERENCIAIS

**A parabolic-elliptic Keller-Segel system with critical mass in any
space dimension**

Alexandre Montaru

Univ. Paris 13

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Resumo: We study radial solutions in a ball of a chemotaxis model, more precisely of a parabolic-elliptic Keller-Segel system with nonlinear and critical sensitivity. The latter is a kind of generalization of the wellknown “linear” case which has 8π as critical mass in dimension 2. In dimension greater than 2, we show that the system also exhibits a critical mass phenomenon, but with strong qualitative differences, namely in the critical case. Moreover, this evolution equation can formally be seen as a gradient flow on an “infinite dimensional Riemannian manifold”. In the subcritical case, this inspired a proof that the uniform convergence of solutions toward the unique steady state has exponential speed.