# SEMINÁRIO DE EQUAÇÕES DIFERENCIAIS

## Nonlinear Schrödinger equation with time dependent potential: large time properties

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**Resumo:** We present recent results on large time behaviour of solutions to the nonlinear Schrödinger equation with time dependent external potential and defocusing nonlinearity. The potential is assumed to grow at most quadratically in space, uniformly for all time, for which a typical example is a (possibly anisotropic) harmonic potential with bounded coefficients in time. We start by presenting a global in time well posedness result without further assumptions on the potential, with a general exponential growth control of its first order derivatives and momenta. As a consequence, these yield a double exponential growth rate of the higher Sobolev norms and momenta. We also show that if the potential is harmonic and isotropic, with coefficients decaying sufficiently fast in time, then there is scattering, the Sobolev norms remain bounded and momenta grow polinomially in time.

This is joint work with Rémi Carles.