

# STABILITY OF MINKOWSKI SPACE IN THE PRESENCE OF A MASSIVE SCALAR FIELD

BENOIT PAUSADER

We consider the Einstein equations in the presence of a massive scalar field and show that even for weakly decaying initial data (in the sense that the metric perturbations falls off more slowly than  $1/r$ ) a small and smooth perturbation of Minkowski space converges back to empty Minkowski space. We also describe the asymptotic properties of the space-time so constructed. Mathematically, this amounts to proving small data global existence and modified scattering for a quasilinear system of wave and Klein-Gordon equations. The interest of the Einstein-scalar field system is that it is one of the simplest model that incorporates dynamical “matter” and gravitational energy in the sense that some components of the system move at a speed slower than the speed of light and thus, even linearly, one is faced with a genuine system. This is joint work with A. Ionescu.