

Higher Order Linear Stability and Instability of Reissner-Nordström's Cauchy Horizon

ABSTRACT. We consider smooth solutions of the wave equation, on a fixed black hole region of a subextremal Reissner-Nordström (asymptotically flat, de Sitter or anti-de Sitter) spacetime, whose restrictions to the event horizon have compact support. We provide criteria, in terms of surface gravities, for the waves to remain in C^l , $l \geq 1$, up to and including the Cauchy horizon. We also provide sufficient conditions for the blow up of solutions in C^1 and H^1 . This is joint work with João L. Costa.