SEMICLASSICAL BREMSSTRAHLUNG FROM A CHARGE RADIALLY FALLING INTO A SCHWARZSCHILD BLACK HOLE

João P. B. Brito[1], Rafael P. Bernar[1], Atsushi Higuchi[2], Luís C. B. Crispino[1]

1 Faculdade de Física, UFPA

2 Dept. of Mathematics, U. of York

A semiclassical investigation of the electromagnetic radiation emitted by a charged particle in a radially freely falling motion in Schwarzschild spacetime is carried out. We use quantum field theory at tree level to obtain the one-particle-emission amplitudes. We analyze and compare the energy spectrum and total energy released, which are calculated from these amplitudes, for particles with varying initial positions and for particles originating from infinity with varying kinetic energy. We also compare the results with those due to a falling charged "string" extended in the radial direction.