



ANALYTICAL COMPUTATION OF THE RADIATION EMISSION FOR CIRCULAR GEODESIC ORBITS AROUND BLACK HOLES

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We investigate analytically the power radiated by a scalar particle in circular geodesic orbits around a Schwarzschild black hole. The radial scalar field modes are written in terms of confluent Heun functions. We obtain the emitted power using the framework of Quantum Field Theory in Curved Spacetimes at tree level. We compare our analytical results with the numerical ones, obtaining excellent agreement. The use of confluent Heun functions to describe the radial modes may also be extended to fields of different spins in other black hole spacetimes.