Juan Valiente Kroon
School of Mathematical Sciences, Queen Mary, University of London

A class of conformal curves for spherically symmetric spacetimes

Authors: J. A. Valiente Kroon

I will discuss a class of conformally privileged curves on spherically symmetric spacetimes. The class of curves under consideration provides a natural generalization of the notion of conformal geodesics for non-vacuum spacetimes. Like conformal geodesics in vacuum spacetimes, these curves can be arranged so that they provide a canonical conformal factor which can be read from the data of the curve. Of particular interest for our analysis are spacetimes containing black hole regions. A natural question in this context is whether the congruence of curves can cover the whole of the outer domain of communication of these spacetimes without forming conjugate points. When this is the case, the congruence can be used to construct "generalized Gaussian coordinates" by means of which one can evaluate (numerically) a conformal representation of the spherically symmetric spacetime. Special attention will be given, in this analysis, to the Reissner-Nordström (non-extremal and extremal), Schwarschild-de Sitter, Schwarzschild-anti de Sitter and Vaydia spacetimes.