A GENERALIZATION OF THE ZIPOY—VOORHEES METRIC IN THE PRESENCE OF A CONFORMALLY INVARIANT SCALAR FIELD

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S u m m a r y

We find and investigate a generalization of the well-known Zipoy—Voorhees metric in the case where its central time-like singularity is also the source of a conformally invariant scalar field. The Zipoy—Voorhees metric known also as the γ-solution, plays an important role in the hierarchy of naked singularities, and its properties are characteristic, as a rule, of some more general classes of solutions. The analysis of the axial naked time-like singularity shows that it can be referred to one of 6 different types. Among them, there are surface singularities as well as linear and paradoxical singularities with negative mass, which was never obtained before. A possibility of forming such singularities by a collapse is discussed.