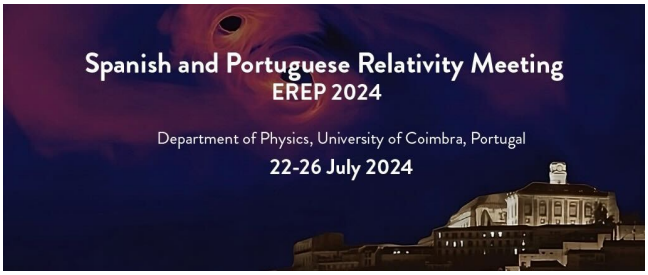

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Static and spherically symmetric vacuum spacetimes with non-expanding principal null directions in $f(R)$ gravity

Wednesday 24 July 2024 16:45 (15 minutes)

In this work we characterize all the static and spherically symmetric vacuum solutions in $f(R)$ gravity when the principal null directions of the Weyl tensor are non-expanding. In contrast to General Relativity, we show that the Nariai spacetime is not the only solution of this type when general $f(R)$ theories are considered. In particular, we find four different solutions for the non-constant Ricci scalar case, all of them corresponding to the same theory, given by $f(R) = r_0^{-1}\ lvert R - 3/r_0^2$
$rvert^{1/2}$, where r_0 is a non-null constant. Finally, we briefly present some geometric properties of these solutions.

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