

# MARGINALLY TRAPPED SURFACES IN LORENTZIAN SPACE FORMS

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The notion of marginally trapped surfaces in Lorentzian manifolds was introduced by Roger Penrose. These surfaces play an extremely important role in physics, for example in the achievement of the singularity theorems, the analysis of gravitational collapse, the cosmic censorship hypothesis and the theory of cosmic black holes.

Mathematically, such a surface is described by the property that its mean curvature vector is light-like at every point. In this work, we classify marginally trapped surfaces in four-dimensional Lorentzian space forms under the extra condition that they have positive relative nullity. Although this is a very restrictive requirement, our result is interesting both for physicists and mathematicians since it provides many interesting examples.