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Cosmology in scalar-tensor f(R,T) gravity

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We apply cosmological reconstruction methods to *f(R,T)* modified gravity, in its recently developed scalar-tensor representation. We do this analysis assuming a perfect fluid in a Friedmann-Lemaître-Robsertson-Walker (FLRW) universe. Solutions with general scale factor, curvature parameter and equation of state are found for the energy density, pressure, and one of the dynamical fields of the scalar-tensor representation. We then apply three particular forms of the scale factor: an exponential expansion (in analogy with the de Sitter solution); and two types of power-law expansion (radiation domination and matter domination). This allows us to find, in each particular case, a complete solution. We do so for each of the three values of the curvature parameter, and with three different values of the equation of state corresponding, in general relativity, to the equation of state of a cosmological constant, of matter and of radiation.

Primary authors: Mr GONÇALVES, Tiago B. (Faculty of Sciences of the University of Lisbon); ROSA, João L. (University of Tartu); LOBO, Francisco S. N. (Science Faculty of the University of Lisbon)

Presenter: Mr GONÇALVES, Tiago B. (Faculty of Sciences of the University of Lisbon)

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