

## Going beyond FLRW in an inhomogeneous Universe: the Szekeres exact solution of GR

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Despite its global successes, the LambdaCDM standard model of cosmology faces currently a number of tensions and anomalies, due to some mismatch between early and late cosmic time physical representations. Indeed, in the era of precision cosmology, large scale inhomogeneities can no more be neglected. Fortunately, an exact GR solution exists, which is perfectly well suited for this purpose. This inhomogeneous solution of the field equations exhibits a pressureless matter-cosmological constant gravitational source and is devoid of any symmetry. Moreover, it possesses the FLRW model as a homogeneous limit and can therefore be smoothly matched to the standard representation at the inhomogeneity-homogeneity transition. In this talk, the Szekeres solution and its main interesting properties, as well as the equations needed to use this solution in a cosmological context will be presented. Then the use of neural networks will be proposed to allow, in the future, a fitting of the huge amount of data becoming available to constrain the model.

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