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# An inhomogeneous cosmological model: the axially symmetric Szekeres GR solution

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Due to the current precision reached by the cosmological surveys, the standard  $\Lambda$ CDM model, despite its successes, has become an insufficient average to describe our actual Universe. Given the tensions arising between theory and observations, it appears that a more precise representation of the local universe is mandatory. Since General Relativity (GR) is the best theory currently available to describe gravitation, the new model should agree with its specifications. The Szekeres solution of GR possesses all the nice properties allowing it to represent an inhomogeneous small scale universe becoming homogeneous (FLRW) at some large transition scale. Moreover, a number of observations shows that the distribution of matter and its expansion are anisotropic in roughly the same direction. While most of the community has been reluctant up to now to use the general Szekeres model, due to its complexity, its axially symmetric version, more simple to deal with, might be more appealing. Therefore, taking advantage of both its compatibility with observations and its relative simplicity, we show how it can be used as a new standard cosmological model.

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