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Testing a curvature model using Fisher forecasts for a Euclid-like spectroscopic Survey

One of the main prediction of inflationary cosmology is the spatial flatness of the universe. The combination of observed CMB fluctuations with SNIa observations and BAO leads to a prediction of the spatial curvature parameter lower than 1e-4. Observations have shown the acceleration of the expansion of the universe revealing the existence of two dark component : the dark matter and the dark energy. According to general relativity as the geometrical tensor is set equal to the matter energy tensor, the curvature parameter is uniquely related to it's energy content. It is therefore possible to test the general relativity at the background level by considering two independent parameters : a dynamical curvature related to the universe energy content, and a geometric curvature related to its curvature, which have both worse constraints than in the GR case.
Euclid, a medium Class ESA mission will give a better understanding of the expansion of the Universe by determining the dark energy equation of state (launching in 2021). In order to accomplish this mission, Euclid will measure the shape over more than one billion galaxies and tens of millions spectroscopic redshifts, for the Galaxy Clustering and Weak Lensing, two independent cosmological probes. This presentation will mainly focus on the estimation of the constraints we can provide on the dark energy equation of state parameters and on the two curvature parameters using forecasts with a Fisher approach. These constraints determined by modeling a Euclid-like spectroscopic survey will be compared with constraints obtained from present day data.

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