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Cosmological Measurement of the gravitational constant G using the latest Planck and DESI data releases

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During the last two decades, a large amount of cosmological data with increasing precision have come up. They contain a wealth of information that goes well beyond the basic cosmological parameters. In particular these datasets allow to make a precise inference of the Gravitational constant G at cosmological scales, complementary to local measurements made on Earth or in the solar system. In this talk, we present updated constraints on G using the recent final Planck data analysis (PR4), along with the Baryon Acoustic Oscillation (BAO) data from DESI. Our analysis demonstrates a one percent measurement of G , consistent with the local CODATA value within one standard deviation. Our analysis also takes into account a modification of the primordial Helium fraction induced by a variation of G . Finally, we show that our result is robust against several assumptions about the cosmological model (spatial curvature or equation of state of dark energy).

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