

# Test of the Einstein equivalence principle with CMB spectral distortions

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The Einstein Equivalence Principle (EEP) is one of the fundamental principles in General Relativity. One of the consequences of the EEP in the cosmological context is the energy independency of the cosmological redshift effect. Here we propose a new test of the energy independency of the redshift effect by the measurement of the spectral distortions of the Cosmic Microwave Background (CMB). In GR, the energy independency of the redshift effect is ensured by the Friedmann-Robertson-Walker metric which does not depend on energy. We show that the CMB spectral distortions arise when the FRW metric has the energy dependence. Our result is consistent with no energy-dependence of the redshift effect, at least, with a precision of  $10^{-6}$  on the CMB energy scales.

## Summary

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