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Astrophysical spectroscopy tests of the Einstein Equivalence Principle: the ESPRESSO era

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Observations of metal absorption systems in the spectra of distant quasars allow stringent tests of the Einstein Equivalence Principle, through constraints on possible variations of the fine-structure constant. A new generation of high-resolution ultra-stable spectrographs, of which ESPRESSO is the first example, enables major advances in this field. Here we summarize the status quo and outline the goals of the ESPRESSO fundamental physics GTO program, leading to Einstein Equivalence Principle constraints that are competitive with the local ones.

Primary author: MARTINS, Carlos (CAUP)

Presenter: MARTINS, Carlos (CAUP)

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