

WST - the Wide-field Spectroscopic Telescope: surveying the Universe in the 2040's and beyond



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WST survey of fundamental constant variations

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Some theoretical extensions of standard cosmology predict that values of fundamental constants vary in time and/or in space. The analysis of 300 quasar absorption spectra collected with VLT/UVES and Keck/HIRES indicate that the fine structure constant, α , may vary as a dipole across the sky. These results are currently being followed-up through observations made using extremely precise spectrographs such as VLT/ESPRESSO, which will produce ~ 100 measurements by 2040.

The WST offers the possibility to produce several thousand measurements in only a few years. The large collecting area, high spectral resolution, and the large multiplexing of WST would be particularly suited to conducting a dedicated survey of varying constants, mapping out any potential variation as a function of time and direction, and placing constraints on fundamental physics theories. I will discuss the requirements such a project would impose on WST.

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