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## The conceptual design of high-resolution optical spectrograph for TMT

High-Resolution Optical Spectrograph (HROS) is one of the proposed second-generation seeing limited instruments on the Nasmyth platform of the Thirty Meter Telescope (TMT). It is a workhorse instrument for TMT in the wavelength band from UV to Near Infrared. We present a conceptual design of a high-resolution optical spectrograph for TMT. The design uses strategies of successful spectrographs (e.g., UVES, ESPRESSO) and incorporates constraints on the maximum available sizes of large optical components. The design offers large flexibility to choose several observing modes to meet the ambitious science goals of extremely large telescopes. HROS has spectral resolutions of  $R \sim 20,000$ - $1,00,000$  combined with a multi-object capability. The instrument design consists of two separate echelle spectrographs to cover the blue and red wavelengths. The combined red and blue spectrographs provide simultaneous wavelength coverage between 310 nm and 1000 nm. Both slit and the fibers inputs are available to meet the high throughput and high stability requirements. Here, we will present a detailed design of the spectrograph, Camera optics, telescope interface, and pre-slit optics and trade of between object selection in single object spectroscopy and multi-objects spectroscopy.

### Presentation type

Oral

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