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Advanced sky subtraction techniques and blind detection of Lyman Alpha Emitters in MOONS GTO data

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MOONS/ Multi Object Optical and Near-infrared Spectrograph is a new fibre fed spectrograph that will be installed at the ESO's/ European Southern Observatory's VLT/Very Large Telescope at La Paranal, Chile. MOONS which will operate from 6000A to 18000A wavelength range will have very high multiplex of 1000 fibres and will use the full 25 arcminutes field of view of 8m mirror VLT and will make redshift surveys like SDSS at larger scale spanning from optical to near infrared regions. MOONS1D is a science simulator developed for the MOONS instrument by Dr. Myriam Rodrigues. I have redesigned the simulator so that it will be a high fidelity science spectra simulator with its inputs and outputs very closely resembling that of the actual instrument. The simulator takes realistic ESO OB as input along with ESO PAF fibre positioning information file and standard templates and simulates the entire observation to provide output based on the current data model of MOONS. The current version of simulator has been bench marked with the ESO's Exposure Time Calculators. From the simulated spectra I will develop new sky subtraction strategies based on PCA/NNMF analysis and neural networks for MOONS. After bench marking the strategies I will use these sky subtraction strategies to perform blind detection of Lyman Alpha Emitters in the MOONS data from the GTO/ Guaranteed Time Observation program.

Astrophysics Field

Spectroscopy, Galaxies, Very Large Telescope

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