

Low-Resolution Spectroscopy in the HETDEX Era

Donald Schneider

The Pennsylvania State University

HETDEX Workshop 18 February 2009

LRS Contribution to HET Science

- LRS has been in operation since 1999, providing multi-band imaging and 400-1000 nm spectroscopy.
- As of December 2008, LRS observations have resulted in 96 of the 139 refereed HET publications (69%) and 3532 of the 4187 citations (84%).
- The LRS has taken advantage of the HET's queue scheduling to have a significant impact on time-critical science programs.

Problem: Wide Field Upgrade Cannot Accommodate LRS!

- Space and focal plane access constraints are too severe to allow placement of the LRS at prime focus
- Imaging can be accomplished by WFU acquisition camera
- HET Low-resolution Spectroscopy Committee (chaired by Mike Eracleous) noted that simply substituting VIRUS for LRS would result in a considerable loss in science capability.

Why VIRUS Cannot Replace the LRS

- VIRUS wavelength coverage is limited to 350 to 550 nm: loss of “red” science (brown dwarfs, high-redshift) and “broad” science (identify unknown redshift).
- VIRUS spectral resolution is ~ 900 ; many programs identified by the Eracleous Committee required $R \sim 2000$.

We cannot afford this loss of science capability!

Future Low-resolution Options

- Use LRS optical components for a bench-mounted, IFU-fed bench spectrograph
- Modify one (or more) VIRUS modules to enhance spectral coverage and/or spectral resolution
- Construct a versatile, perhaps “multi-armed” IFU-fed bench spectrograph.

Evaluation of Options

- Bench mounting the current LRS is relatively cheap and quick, but will not produce a competitive instrument: it would be a misallocation of resources to pursue this path.
- New spectrograph options are preferred. The primary hurdle is not financial, but leadership!

How Should We Proceed?

- If we are going to maintain HET's suite of low-resolution science programs we must identify someone in the collaboration with the technical skill and scientific interest to lead the effort to build a new low-resolution instrument.
- If we are to avoid an "LRS gap", the effort to construct the new instrument must begin by 17 February 2009.