

1 Problem 4: AY257 Spring 2006

At <http://www.ucolick.org/~bolte/AY257/PROBLEM4/GALAXIES> are a number of fits files with LRIS-B spectra. The frames are overscan subtracted and trimmed. The program is to identify dwarf galaxy members of nearby groups. These data are from the Kast spectrometer at the 3m.

There are three sets of frames:

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HR3905.fits      (bright star)
barc_hr3905.fits (arc lamp spectrum for HR3905)
bflat_hr3905.fits (quartz lamp spectrum for HR3905)

H68_F5-7.fits   (dwarf galaxy candidate in the Hickson Compact Group H68)
barc_h68.fits
bflat_h68.fits

Leo_F6H-1.fits  (dwarf galaxy candidate in the Leo Group)
barc_leo.fits
bflat_leo.fits
```

1. Extract the stellar spectrum (`noao.twod.apextract`, *apall*) and associated arc and flat. Flat-field the stellar spectrum and use the arc plus *noao.oned.identify* to determine the wavelength-to-pixel mapping and apply this to the stellar spectrum. Make a plot of the stellar spectrum with major absorption features identified and the sky spectrum with the strongest lines identified. Measure the radial velocity of the star by determining the positions of several absorption lines. Use `noao.rv.rvcorrect` to determine the heliocentric correction and apply it.
2. Divide the two flats taken for the galaxies into the HR3905 and look for evidence of a shift due to flexure. Use `noao.rv.fxcor` to determine if there are shifts between the arcs.
3. Extract the two galaxy spectra, flat-field them, apply the dispersion solution along with any corrections implied by the arc cross-correlation then determine the radial velocity of each galaxy by cross-correlation with the HR3905 spectrum.