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ASpect: A New Spectrum and Line Analysis Package for IRAF

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We examined several publicly available spectral analysis software packages looking for one with enough functionality and versatility to meet the analysis needs of astronomers during the next decade—none can satisfactorily support the wide variety of panchromatic science programs that are now becoming possible. Furthermore, we concluded that none of these packages can be simply modified to include critical functions because of their original (limited) designs. During the next two years we will write a new spectral analysis package, *ASpect*, that will incorporate the latest analysis techniques for astronomical spectra in all wavelength domains.

The *ASpect* package has several functional requirements. It must operate on spectra from a wide variety of ground-based and space-based instruments, spanning wavelengths from radio to gamma rays. It must accommodate non-linear dispersion relations. It must provide a variety of functions, individually or in combination, with which to fit spectral features and the continuum. It is vitally important that known bad data be masked, and that uncertainties be propagated throughout the calculations in order for astronomers to evaluate the reliability of results. Finally, this new package must provide a powerful, intuitive graphical user interface to handle the burden of data input/output (I/O), on-line “help”, selection of relevant features for analysis, plotting and graphical interaction, and data base management, all in a comprehensible environment.

We anticipate that *ASpect* will take the form of an external package in IRAF (such as the NOAO and STSDAS packages), and will be layered upon the IRAF Virtual Operating System to make it available on as many platforms as possible, while making it resistant to changes in operating systems and compilers. Our choice of IRAF is motivated by its portability, its wide use within the astronomical community, and its rich set of existing user applications.