ASpec: A New Spectrum and Line Analysis Package for IRAF

Final Report: 1 December 1996
Stephen J. Hulbert, STScI

Summary
The ASpec (Version 1.0 Beta) software package is now available. The software can be obtained from the following location: ftp://ftp.stsci.edu/software/ASpec.

Software
Version 1.0 Beta of the ASpec software package is complete and now available to the public. This software package provides tools for the analysis of astronomical spectra. The package consists of the source code (written in the IRAF programming language, spp), the IRAF mkpkg files necessary to compile and link the package, and installation and test procedures (including test data) necessary for installing the software.

Software Capabilities
ASpec:
- operates on spectra from a wide variety of ground-based and space-based instruments
- simultaneously handles spectra from different wavelength regimes
- accommodates non-linear dispersion relations
- provides a variety of functions, individually or in combination, with which to fit spectral features and the continuum
- permits the masking of known bad data
- provides a powerful, intuitive graphical user interface implemented using the new IRAF Object Manager and customized to handle:
  - data input/output (I/O)
  - on-line “help”
  - selection of relevant features for analysis
  - plotting and graphical interaction
  - data base management

Documentation
The following documentation is available to support using the ASpec package:

ASpec Handbook
description of the modeling process used in ASpec. The Installation Guide provides a cookbook for installing and testing the ASpec software.

**High-Level Design Documentation**
The ASpec design documents describe the framework used in the development of the ASpec package.

**Commented Source Code**
The source code, written in spp, contains many useful comments. Additionally, each subroutine interface is described using the IRAF help facility. Descriptions of all subroutine calls have been extracted and are available.
Appendix A: NASA Astronomical Software Directory Information for ASpec

Title: ASpec—A New Line and Spectrum Analysis Package for IRAF

Authors: Jonathan D. Eisenhamer, Stephen J. Hulbert, Zoltan G. Levay, and Richard A. Shaw (STScI)

Organization responsible for distribution: STScI

Organization responsible for maintenance: STScI

Software Release Date and Version Number: 1 December 1996/1.0 Beta

Abstract: ASpec is a new spectrum and line analysis package developed at STScI. ASpec is designed as an add-on package for IRAF and incorporates a variety of analysis techniques for astronomical spectra. ASpec operates on spectra from a wide variety of ground-based and space-based instruments. ASpec allows simultaneous handling of spectra from different wavelength regimes. ASpec accommodates non-linear dispersion relations. ASpec provides a variety of functions, individually or in combination, with which to fit spectral features and the continuum. ASpec permits the masking of known bad data. ASpec provides a powerful, intuitive graphical user interface implemented using the new IRAF Object Manager and customized to handle: data input/output (I/O); on-line “help”; selection of relevant features for analysis; plotting and graphical interaction; data base management

System/Physical Description: ASpec runs as an add-on package to IRAF and uses the X11IRAF task, xgterm. Support for X11IRAF is available with versions of IRAF starting with 2.10.3. The source language for ASpec is the IRAF programming language, spp. The completely installed ASpec package requires approximately 6 Mbytes of disk space.

Software Dependency Information: ASpec runs under IRAF and requires XIRAF task, xgterm, and the TABLES add-on package to IRAF.

Statement of Robustness and Use History: ASpec is currently available as a Beta version only and as such has seen limited use. Additional testing is required to verify the robustness of the package.

Keywords: IRAF, line fitting, spectrum analysis

Sources of funding for development of software: This software was prepared by Space Telescope Science Institute under U.S. Government contract NAS5-31859. This project was funded under the Astrophysical Data Program (ADP).
Appendix B: Listing of the ASpec Distribution Files

The following files can be found at ftp://ftp.stsci.edu/software/ASpec:

<table>
<thead>
<tr>
<th>Directory</th>
<th>File</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>./</td>
<td>README</td>
<td>This file</td>
</tr>
<tr>
<td>software</td>
<td>aspec_v1.0beta.tar</td>
<td>The ASpec package</td>
</tr>
<tr>
<td>documents/help</td>
<td>aspec_all.ps</td>
<td>Complete ASpec Handbook</td>
</tr>
<tr>
<td></td>
<td>aspec_title.ps</td>
<td>Title Page</td>
</tr>
<tr>
<td></td>
<td>aspec_contents.ps</td>
<td>Table of Contents</td>
</tr>
<tr>
<td></td>
<td>aspec_faqs.ps</td>
<td>Frequently Asked Questions</td>
</tr>
<tr>
<td></td>
<td>aspec_users.ps</td>
<td>User’s Guide</td>
</tr>
<tr>
<td></td>
<td>aspec_reference.ps</td>
<td>Reference Guide</td>
</tr>
<tr>
<td></td>
<td>aspec_install.ps</td>
<td>Installation Guide</td>
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<tr>
<td></td>
<td>aspec_index.ps</td>
<td>Index</td>
</tr>
<tr>
<td>documents/design</td>
<td>aspec_design.ps</td>
<td>ASpec design document</td>
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<tr>
<td></td>
<td>aspec_design_dbase.ps</td>
<td>ASpec database design document</td>
</tr>
<tr>
<td>documents/misc</td>
<td>aspec_prop.ps</td>
<td>Original ADP proposal</td>
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<tr>
<td></td>
<td>aspec_prop_ttlpg.ps</td>
<td>Title page for ADP proposal</td>
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<tr>
<td></td>
<td>sub_calls.asc</td>
<td>Listing of subroutine interfaces</td>
</tr>
<tr>
<td></td>
<td>yellow_pages_entry.asc</td>
<td>NASA Astronomical Software Directory information</td>
</tr>
</tbody>
</table>

NOTE: a compressed version (gzip) of most files is also available.
Contract: NAS5-31859

Principal Investigator: Dr. Stephen Hulbert

Institution: Space Telescope Science Institute

Patents/Inventions Developed: NONE
Contract: NAS5-31859

Principal Investigator: Dr. Stephen Hulbert

Institution: Space Telescope Science Institute

NONE
**Title and Subtitle**

ASpec: A New Spectrum and Line Analysis Package for IRAF

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Washington, D.C. 20546-0001

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