The NOAO Packages
IRAF Version 2.10

- **noao:**

artdata	-	Artificial data generation package	[up]
astrometry	-	Astrometry package	
astutil	-	Astronomical utilities package	[up]
digiphot	-	Digital stellar photometry package	[up]
focas	-	Faint object classification and analysis package	
imred	-	Image reductions package	[up]
mtlocal	-	Magtape i/o for special NOAO format tapes	[up]
nobsolete	-	Obsolete tasks to be phased out in a future release	[up]
nproto	-	Prototype (temporary, contributed) tasks	[up]
observatory	-	Examine and define observatory parameters	[up]
onedspec	-	One dimensional spectral red & analysis package	[up]
rv	-	Radial velocity analysis package	[up]
surfphot	-	Galaxy isophotal analysis package	
twodspec	-	Two dimensional spectral red & analysis package	[up]

- **noao.artdata:**

gallist	-	Make an artificial galaxies list
mk1dspec	-	Make/add artificial 1D spectra
mk2dspec	-	Make/add artificial 2D spectra using 1D spectra templates
mkechelle	-	Make artificial 1D and 2D echelle spectra
mkexamples	-	Make artificial data examples
mkheader	-	Append/replace header parameters
mknoise	-	Make/add noise and cosmic rays to 1D/2D images
mkobjects	-	Make/add artificial stars and galaxies to 2D images
mkpattern	-	Make/add patterns to images
starlist	-	Make an artificial star list

- **noao.astutil:**

airmass	-	Compute the airmass at a given elevation above the horizon
asttimes	-	Compute UT, Julian day, epoch, and siderial time
ccdtime	-	Compute time required to observe star of given magnitude
galactic	-	Convert ra, dec to galactic coordinates
gratings	-	Compute and print grating parameters
pdm	-	Find periods in light curves by Phase Dispersion Minimization
precess	-	Precess a list of astronomical coordinates
rvcorrect	-	Compute radial velocity corrections
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images

- **noao.digiphot:**

apphot	-	Aperture Photometry Package
daophot	-	Dao Crowded-Field Photometry Package
photcal	-	Photometric Calibration Package
ptools	-	Photometry Tools Package

- **noao.digiphot.apphot:**

aptest	-	Run basic tests on the apphot package tasks
center	-	Compute accurate centers for a list of objects
centerpars	-	Edit the centering parameters
daofind	-	Find stars in an image using the DAO algorithm
datapars	-	Edit the data dependent parameters
fitpsf	-	Model the stellar psf with an analytic function
fitsky	-	Compute sky values in a list of annular or circular regions
fitskypars	-	Edit the sky fitting parameters
phot	-	Measure magnitudes for a list of stars
photpars	-	Edit the photometry parameters
polymark	-	Create polygon lists for polyphot
polyphot	-	Measure magnitudes inside a list of polygonal regions
polypars	-	Edit the polyphot parameters
qphot	-	Measure quick magnitudes for a list of stars
radprof	-	Compute the stellar radial profile of a list of stars
wphot	-	Measure magnitudes for a list of stars with weighting
lintran	-	Linearly transform a coordinate list
pexamine	-	Interactively examine or edit an apphot output file
txdump	-	Dump select fields from an apphot output file

- **noao.digiphot.daophot:**

addstar	-	Add artificial stars to an image using the computed psf
allstar	-	Group and fit psf to multiple stars simultaneously
centerpars	-	Edit the centering algorithm parameters
daofind	-	Find stars in an image using the DAO algorithm
daopars	-	Edit the daophot algorithms parameter set
daotest	-	Run basic tests on the daophot package tasks
datapars	-	Edit the data dependent parameters
fitskypars	-	Edit the sky fitting algorithm parameters
group	-	Group stars based on positional overlap and signal/noise
nstar	-	Fit the psf to groups of stars simultaneously
peak	-	Fit the psf to single stars
phot	-	Compute sky values and initial magnitudes for a list of stars
photpars	-	Edit the photometry parameters
psf	-	Fit the point spread function
seepsf	-	Compute an image of the point spread function
substar	-	Subtract the fitted stars from the original image
pappend	-	Concatenate a list of daophot databases
pconvert	-	Convert a text database to a tables database
pdump	-	Print selected fields from a list of daophot databases
grpselect	-	Select groups of a specified size from a daophot database
pexamine	-	Interactively examine and edit a daophot database
prenumber	-	Renumber stars in a daophot database
pselect	-	Select records from a daophot database
psort	-	Sort a daophot database

- **noao.digiphot.ptools:**

istable	-	Is a file a table or text database file ?
pappend	-	Concatenate a list of apphot/daophot databases

pconvert	-	Convert from an apphot/daophot text to tables database
pdump	-	Print selected columns of a list of daophot/apphot databases
prenumber	-	Renumber a list of apphot/daophot databases
pexamine	-	Interactively examine and edit an apphot/daophot database
pselect	-	Select records from a list of apphot/daophot databases
psort	-	Sort a list of apphot/daophot databases
pttest	-	Run basic tests on the ptools package tasks
tbappend	-	Concatenate a list of apphot/daophot tables databases
tbdump	-	Print selected columns of a list of tables databases
tbrenumber	-	Renumber a list of apphot/daophot tables databases
tbselect	-	Select records from a list of apphot/daophot tables databases
tbsort	-	Sort a list of apphot/daophot tables databases
txappend	-	Concatenate a list of apphot/daophot text databases
txdump	-	Print selected columns of a list of apphot/daophot text databases
txrenumber	-	Renumber a list of apphot/daophot text databases
txselect	-	Select records from a list of apphot/daophot text databases
txsort	-	Sort a list of apphot/daophot text databases

- **noao.imred:**

argus	-	CTIO ARGUS reduction package
bias	-	General bias subtraction tools
ccdred	-	Generic CCD reductions
ctioslit	-	CTIO spectrophotometric reduction package
dtoi	-	Density to Intensity reductions for photographic plates
echelle	-	Echelle spectra reductions (slit and FOE)
generic	-	Generic image reductions tools
hydra	-	KPNO HYDRA (and NESSIE) reduction package
iids	-	KPNO IIDS spectral reductions
irred	-	KPNO IR camera reductions
irs	-	KPNO IRS spectral reductions
kpnocoude	-	KPNO coude reduction package (slit and 3 fiber)
kpnoslit	-	KPNO low/moderate dispersion slits (Goldcam, RCspec, Whitecam)
specred	-	Generic slit and fiber spectral reduction package
vtel	-	Solar vacuum telescope image reductions

- **noao.imred.argus:**

apall	-	Extract 1D spectra (all parameters in one task)
apdefault	-	Set the default aperture parameters
apedit	-	Edit apertures interactively
apfind	-	Automatically find spectra and define apertures
aprecenter	-	Recenter apertures
apresize	-	Resize apertures
apsum	-	Extract 1D spectra
aptrace	-	Trace positions of spectra
bplot	-	Batch plots of spectra
continuum	-	Fit the continuum in spectra
dispcor	-	Dispersion correct spectra
dopcor	-	Doppler correct spectra
identify	-	Identify features in spectrum for dispersion solution

msresp1d	-	Create 1D response spectra from flat field and sky spectra
refspectra	-	Assign wavelength reference spectra to other spectra
reidentify	-	Automatically identify features in spectra
sapertures	-	Set or change aperture header information
sarith	-	Spectrum arithmetic
scombine	-	Combine spectra having different wavelength ranges
scopy	-	Select and copy apertures in different spectral formats
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
slist	-	List spectrum header parameters
specplot	-	Stack and plot multiple spectra
splot	-	Preliminary spectral plot/analysis
doargus	-	Process ARGUS spectra
demos	-	Demonstrations and tests

- **noao.imred.bias:**

colbias	-	Fit and subtract an average column bias
linebias	-	Fit and subtract an average line bias

- **noao.imred.ccdred:**

badpiximage	-	Create a bad pixel mask image from a bad pixel file
ccdgroups	-	Group CCD images into image lists
ccdhedit	-	CCD image header editor
ccdinstrument	-	Review and edit instrument translation files
ccdlist	-	List CCD processing information
ccdproc	-	Process CCD images
ccdtest	-	CCD test and demonstration package
combine	-	Combine CCD images
cosmicrays	-	Detect and replace cosmic rays
darkcombine	-	Combine and process dark count images
flatcombine	-	Combine and process flat field images
mkfringecor	-	Make fringe correction images from sky images
mkillumcor	-	Make flat field illumination correction images
mkillumflat	-	Make illumination corrected flat fields
mkskycor	-	Make sky illumination correction images
mkskyflat	-	Make sky corrected flat field images
setinstrument	-	Set instrument parameters
zerocombine	-	Combine and process zero level images

ADDITIONAL HELP TOPICS

ccdgeometry	-	Discussion of CCD coordinate/geometry keywords
ccdtypes	-	Description of the CCD image types
flatfields	-	Discussion of CCD flat field calibrations
guide	-	Introductory guide to using the CCDRED package
instruments	-	Instrument specific data files
package	-	CCD image reduction package
subsets	-	Description of CCD subsets

- **noao.imred.ccdred.ccdtest:**

artobs	-	Create an artificial CCD observation
demo	-	Run a demonstration of the CCD reduction package
mkimage	-	Make or modify an image with simple values
subsection	-	Create an artificial subsection CCD observation

- **noao.imred.ctioslit:**

apall	-	Extract 1D spectra (all parameters in one task)
apdefault	-	Set the default aperture parameters
apedit	-	Edit apertures interactively
apfind	-	Automatically find spectra and define apertures
aprecenter	-	Recenter apertures
apresize	-	Resize apertures
apsum	-	Extract 1D spectra
aptrace	-	Trace positions of spectra
bplot	-	Batch plot of spectra with SPLOT
calibrate	-	Apply extinction and flux calibrations to spectra
continuum	-	Fit and normalize the continuum of multispec spectra
deredden	-	Apply interstellar extinction corrections
dispcor	-	Dispersion correct spectra
dopcor	-	Doppler correct spectra
identify	-	Identify arc lines and determine a dispersion function
refspectra	-	Assign reference spectra to object spectra
reidentify	-	Reidentify arc lines and determine new dispersion functions
sarith	-	Spectrum arithmetic
scombine	-	Combine spectra
scopy	-	Copy spectra including aperture selection and format changes
sensfunc	-	Create sensitivity function
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
slist	-	List spectral header elements
specplot	-	Stack and plot multiple spectra
splot	-	Plot and analysis spectra
standard	-	Identify standard stars to be used in sensitivity calc
doslit	-	Process CTIO slit spectra
demos	-	Demonstrations and tests

- **noao.imred.dtoi:**

dematch	-	Match a list of density values to exposure values
hdfit	-	Fit a curve to density, log exposure values
hdshift	-	Align related HD curves
hdtoi	-	Apply DTOI transformation to density image
selftest	-	Self test program to check DTOI transformation
spotlist	-	Generate a list of calibration spot values

- **noao.imred.echelle:**

apall	-	Extract 1D spectra (all parameters in one task)
apdefault	-	Set the default aperture parameters and apidtable
apedit	-	Edit apertures interactively

apfind	-	Automatically find spectra and define apertures
apfit	-	Fit 2D spectra and output the fit, difference, or ratio
apflatten	-	Remove overall spectral and profile shapes from flat fields
apmask	-	Create an IRAF pixel list mask of the apertures
apnormalize	-	Normalize 2D apertures by 1D functions
aprecenter	-	Recenter apertures
apresize	-	Resize apertures
apscatter	-	Fit and subtract scattered light
apsum	-	Extract 1D spectra
aptrace	-	Trace positions of spectra
bplot	-	Batch plots of spectra
calibrate	-	Apply extinction and flux calibrations to spectra
continuum	-	Fit the continuum in spectra
deredden	-	Apply interstellar extinction corrections
dispcor	-	Dispersion correct spectra
dopcor	-	Doppler correct spectra
ecidentify	-	Identify features in spectrum for dispersion solution
ecreidentify	-	Automatically reidentify features in spectra
refspectra	-	Assign wavelength reference spectra to other spectra
sarith	-	Spectrum arithmetic
scombine	-	Combine spectra
scopy	-	Select and copy apertures in different spectral formats
sensfunc	-	Compute sensitivity function
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
slist	-	List spectrum header parameters
specplot	-	Stack and plot multiple spectra
splot	-	Preliminary spectral plot/analysis
standard	-	Identify standard stars to be used in sensitivity calc
doecslit	-	Process Echelle slit spectra
dofoe	-	Process Fiber Optic Echelle (FOE) spectra
demos	-	Demonstrations and tests

- **noao.imred.generic:**

background	-	Fit and subtract a line or column background
cosmicrays	-	Detect and replace cosmic rays
darksub	-	Scale and subtract a dark count image
flat1d	-	Make flat field by fitting a 1D func. to the lines or columns
flatten	-	Flatten images using a flat field
normalize	-	Normalize images
normflat	-	Create a flat field by normalizing and replacing low values

- **noao.imred.hydra:**

apall	-	Extract 1D spectra (all parameters in one task)
apdefault	-	Set the default aperture parameters
apedit	-	Edit apertures interactively
apfind	-	Automatically find spectra and define apertures
aprecenter	-	Recenter apertures
apresize	-	Resize apertures
apscatter	-	Fit and remove scattered light

apsum	-	Extract 1D spectra
aptrace	-	Trace positions of spectra
bplot	-	Batch plots of spectra
continuum	-	Fit the continuum in spectra
dispcor	-	Dispersion correct spectra
dopcor	-	Doppler correct spectra
identify	-	Identify features in spectrum for dispersion solution
msresp1d	-	Create 1D response spectra from flat field and sky spectra
refspectra	-	Assign wavelength reference spectra to other spectra
reidentify	-	Automatically identify features in spectra
sapertures	-	Set or change aperture header information
sarith	-	Spectrum arithmetic
scombine	-	Combine spectra having different wavelength ranges
scopy	-	Select and copy apertures in different spectral formats
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
slist	-	List spectrum header parameters
specplot	-	Stack and plot multiple spectra
splot	-	Preliminary spectral plot/analysis
dohydra	-	Process HYDRA spectra
demos	-	Demonstrations and tests

- **noao.imred.iids:**

addsets	-	Add subsets of strings of spectra
batchred	-	Batch processing of IIDS/IRS spectra
bplot	-	Batch plots of spectra
bswitch	-	Beam-switch strings of spectra to make obj-sky pairs
calibrate	-	Apply sensitivity correction to spectra
coefs	-	Extract mtn reduced ceofficients from henear scans
coincor	-	Correct spectra for detector count rates
continuum	-	Fit the continuum in spectra
deredden	-	Apply interstellar extinction corrections
dispcor	-	Dispersion correct spectra
dopcor	-	Doppler correct spectra
extinct	-	Use BSWITCH for extinction correction
flatdiv	-	Divide spectra by flat field
flatfit	-	Sum and normalize flat field spectra
identify	-	Identify features in spectrum for dispersion solution
lcalib	-	List calibration file data
mkspec	-	Generate an artificial spectrum
names	-	Generate a list of image names from a string
powercor	-	Apply power law correction to mountain reduced spectra
process	-	A task generated by BATCHRED
refspectra	-	Assign reference spectra to object spectra
reidentify	-	Automatically identify features in spectra
scombine	-	Combine spectra having different wavelength ranges
sensfunc	-	Create sensitivity function
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
sinterp	-	Interpolate a table of x,y pairs to create a spectrum
slist1d	-	List spectral header elements

specplot	-	Stack and plot multiple spectra
splot	-	Preliminary spectral plot/analysis
standard	-	Identify standard stars to be used in sensitivity calc
subsets	-	Substract pairs in strings of spectra
sums	-	Generate sums of object and sky spectra by aperture

- **noao.imred.irred:**

center	-	Compute accurate centers for a list of objects
centerpars	-	Edit the centering parameters
datapars	-	Edit the data dependent parameters
flatten	-	Flatten images using a flat field
iralign	-	Align the image produced by irmosaic
irmatch1d	-	Align and intensity match the image produced by irmosaic (1D)
irmatch2d	-	Align and intensity match the image produced by irmosaic (2D)
irmosaic	-	Mosaic an ordered list of images onto a grid
mosproc	-	Prepare images for quick look mosaicing
txdump	-	Select fields from the center task output text file

- **noao.imred.irs:**

addsets	-	Add subsets of strings of spectra
batchred	-	Batch processing of IIDS/IRS spectra
bplot	-	Batch plots of spectra
bswitch	-	Beam-switch strings of spectra to make obj-sky pairs
calibrate	-	Apply sensitivity correction to spectra
coefs	-	Extract mtn reduced ceofficients from henear scans
continuum	-	Fit the continuum in spectra
deredden	-	Apply interstellar extinction corrections
dispcor	-	Dispersion correct spectra
dopcor	-	Doppler correct spectra
extinct	-	Use BSWITCH for extinction correction
flatdiv	-	Divide spectra by flat field
flatfit	-	Sum and normalize flat field spectra
identify	-	Identify features in spectrum for dispersion solution
lcalib	-	List calibration file data
mkspec	-	Generate an artificial spectrum
names	-	Generate a list of image names from a string
process	-	A task generated by BATCHRED
refspectra	-	Assign reference spectra to object spectra
reidentify	-	Automatically identify features in spectra
scombine	-	Combine spectra having different wavelength ranges
sensfunc	-	Create sensitivity function
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
sinterp	-	Interpolate a table of x,y pairs to create a spectrum
slist1d	-	List spectral header elements
specplot	-	Stack and plot multiple spectra
splot	-	Preliminary spectral plot/analysis
standard	-	Identify standard stars to be used in sensitivity calc
subsets	-	Substract pairs in strings of spectra
sums	-	Generate sums of object and sky spectra by aperture

- **noao.imred.kpnocoude:**

apall	-	Extract 1D spectra (all parameters in one task)
apdefault	-	Set the default aperture parameters
apedit	-	Edit apertures interactively
apfind	-	Automatically find spectra and define apertures
aprecenter	-	Recenter apertures
apresize	-	Resize apertures
apsum	-	Extract 1D spectra
aptrace	-	Trace positions of spectra
bplot	-	Batch plot of spectra with SPLOT
calibrate	-	Apply extinction and flux calibrations to spectra
continuum	-	Fit and normalize the continuum of multispec spectra
deredden	-	Apply interstellar extinction corrections
dispcor	-	Dispersion correct spectra
dopcor	-	Doppler correct spectra
identify	-	Identify arc lines and determine a dispersion function
msresp1d	-	Create fiber response spectra from flat field and sky spectra
refspectra	-	Assign reference spectra to observations
reidentify	-	Reidentify arc lines and determine new dispersion functions
sapertures	-	Set or change aperture header information
sarith	-	Spectrum arithmetic
scombine	-	Combine spectra
scopy	-	Copy spectra including aperture selection and format changes
sensfunc	-	Create sensitivity function
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
slist	-	List spectrum headers
specplot	-	Stack and plot multiple spectra
splot	-	Plot and analyze spectra
standard	-	Identify standard stars to be used in sensitivity calc
do3fiber	-	Process KPNO coude three fiber spectra
doslit	-	Process KPNO coude slit spectra
demos	-	Demonstrations and tests

- **noao.imred.kpnoslit:**

apall	-	Extract 1D spectra (all parameters in one task)
apdefault	-	Set the default aperture parameters
apedit	-	Edit apertures interactively
apfind	-	Automatically find spectra and define apertures
aprecenter	-	Recenter apertures
apresize	-	Resize apertures
apsum	-	Extract 1D spectra
aptrace	-	Trace positions of spectra
bplot	-	Batch plot of spectra with SPLOT
calibrate	-	Apply extinction and flux calibrations to spectra
continuum	-	Fit and normalize the continuum of multispec spectra
deredden	-	Apply interstellar extinction corrections
dispcor	-	Dispersion correct spectra
dopcor	-	Doppler correct spectra
identify	-	Identify arc lines and determine a dispersion function

refspectra	-	Assign reference spectra to observations
reidentify	-	Reidentify arc lines and determine new dispersion functions
sarith	-	Spectrum arithmetic
scombine	-	Combine spectra
scopy	-	Copy spectra including aperture selection and format changes
sensfunc	-	Create sensitivity function
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
slist	-	List spectrum headers
specplot	-	Stack and plot multiple spectra
splot	-	Plot and analyze spectra
standard	-	Identify standard stars to be used in sensitivity calc
doslit	-	Process slit spectra
demos	-	Demonstrations and tests

- **noao.imred.specred:**

apall	-	Extract 1D spectra (all parameters in one task)
apdefault	-	Set the default aperture parameters and apidtable
apedit	-	Edit apertures interactively
apfind	-	Automatically find spectra and define apertures
apfit	-	Fit 2D spectra and output the fit, difference, or ratio
apflatten	-	Remove overall spectral and profile shapes from flat fields
apmask	-	Create and IRAF pixel list mask of the apertures
apnormalize	-	Normalize 2D apertures by 1D functions
aprecenter	-	Recenter apertures
apresize	-	Resize apertures
apscatter	-	Fit and subtract scattered light
apsum	-	Extract 1D spectra
aptrace	-	Trace positions of spectra
bplot	-	Batch plot of spectra with SPLOT
calibrate	-	Extinction and flux calibrate spectra
continuum	-	Fit the continuum in spectra
deredden	-	Apply interstellar extinction correction
dispcor	-	Dispersion correct spectra
dopcor	-	Doppler correct spectra
fitprofs	-	Fit gaussian profiles
identify	-	Identify features in spectrum for dispersion solution
msresp1d	-	Create 1D response spectra from flat field and sky spectra
refspectra	-	Assign wavelength reference spectra to other spectra
reidentify	-	Automatically reidentify features in spectra
sapertures	-	Set or change aperture header information
sarith	-	Spectrum arithmetic
scombine	-	Combine spectra
scopy	-	Select and copy apertures in different spectral formats
sensfunc	-	Compute instrumental sensitivity from standard stars
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
sfit	-	Fit spectra and output fit, ratio, or difference
skysub	-	Sky subtract extracted multispec spectra
slist	-	List spectrum header parameters
specplot	-	Scale, stack, and plot multiple spectra

splot	-	Preliminary spectral plot/analysis
standard	-	Tabuluate standard star counts and fluxes
dofibers	-	Process fiber spectra
doslit	-	Process slit spectra

- **noao.imred.vtel:**

destreak	-	Destreak He 10830 grams.
destreak5	-	First pass processing CL script for 10830 grams.
dicoplot	-	Make dicomed plots of carrington maps.
fitslogr	-	Make a log of certain header parameters from a FITS tape.
getsqib	-	Extract the squibby brightness image from a full disk scan.
makehelium	-	Cl script for processing destreaked 10830 grams(second pass).
makeimages	-	Cl script for processing magnetograms into projected maps
merge	-	Merge daily grams into a Carrington map.
mrotlogr	-	Log some header parameters from a FITS rotation map tape.
mscan	-	Read all sector scans on a tape and put them into images.
pimtext	-	Put text directly into images using a pixel font.
putsqib	-	Merge a squibby brightness image into a full disk image.
quickfit	-	Fit an ellipse to the solar limb.
readvt	-	Read a full disk tape and produce an IRAF image.
rmap	-	Map a full disk image into a 180 by 180 flat image.
syndico	-	Make dicomed print of daily grams 18 cm across.
tcopy	-	Tape to tape copy routine.
trim	-	Set all pixels outside the limb to 0.0 (use sqib for limb).
unwrap	-	Remove effects of data wraparound on continuum scans.
vtblink	-	Blink daily grams on the IIS to check for registration.
vtexamine	-	Examine a vacuum telescope tape, print headers and profile.
writetape	-	Cl script to write 5 full disk grams to tape.
writevt	-	Write an IRAF image to tape in vacuum telescope format.

- **noao.mtlocal:**

ldumpf	-	List the permanent files on a Cyber DUMPF tape
r2df	-	Convert a CTIO 2-d frutti image into an IRAF image
rcamera	-	Convert a CAMERA image into an IRAF image
rdumpf	-	Convert IPPS rasters from a DUMPF tape to IRAF images
ridsfile	-	Convert IDSFILES from a DUMPF tape to IRAF images
ridsmtn	-	Convert mountain format IDS/IRS data to IRAF images
ridsout	-	Convert a text file in IDSOUT format to IRAF images
rpds	-	Convert a PDS image into an IRAF image
rrcopy	-	Convert IPPS rasters from an RCOPY tape to IRAF images
widstape	-	Convert ONEDSPEC spectra to IDSOUT text format

- **noao.nproto:**

binpairs	-	Bin pairs of (x,y) points in log separation
findgain	-	Estimate the gain and readnoise of a CCD
findthresh	-	Estimate a CCD's sky noise from the gain and readnoise
iralign	-	Align the mosaiced image produced by irmosaic
irmatch1d	-	Align and intensity match image produced by irmosaic (1D)
irmatch2d	-	Align and intensity match image produced by irmosaic (2D)
irmosaic	-	Mosaic an ordered list of images onto a grid

linpol	-	Calculate polarization frames and Stoke's parameters
slitpic	-	Generate IRAF image of aperture slit mask

- **noao.onedspec:**

bplot	-	Batch plots of spectra
calibrate	-	Apply extinction and flux calibrations to spectra
continuum	-	Fit the continuum in spectra
deredden	-	Apply interstellar extinction correction
dispaxis	-	Dispersion axis parameters for 2D images
dispcor	-	Dispersion correct spectra
dopcor	-	Apply doppler corrections
fitprofs	-	Fit gaussian profiles
identify	-	Identify features in spectrum for dispersion solution
lcalib	-	List calibration file data
mkspec	-	Generate an artificial spectrum
names	-	Generate a list of image names from a string
ndprep	-	Make neutral density filter calibration image
refspectra	-	Assign wavelength reference spectra to other spectra
reidentify	-	Automatically identify features in spectra
sapertures	-	Set or change aperture header information
sarith	-	Spectrum arithmetic
scombine	-	Combine spectra having different wavelength ranges
scopy	-	Select and copy apertures in different spectral formats
sensfunc	-	Create sensitivity function
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
sfit	-	Fit spectra and output fit, ratio, or difference
sinterp	-	Interpolate a table of x,y pairs to create a spectrum
slist	-	List spectrum header parameters
specplot	-	Stack and plot multiple spectra
splot	-	Preliminary spectral plot/analysis
standard	-	Identify standard stars to be used in sensitivity calc

ADDITIONAL HELP TOPICS

package	-	Discussion and overview of package including sections on: spectral formats, dispersion coordinates, and units

- **noao.rv:**

continpars	-	Edit continuum subtraction parameters
filtpars	-	Edit the filter function parameters
fxcor	-	Radial velocities via Fourier cross correlation
keywpars	-	Translate the image header keywords used in RV package
rvcorrect	-	Compute radial velocity corrections

- **noao.twodspec:**

apextract	-	Aperture Extraction Package
longslit	-	Longslit Package

- **noao.twodspec.apextract:**

apall	-	Extract 1D spectra (all parameters in one task)
apdefault	-	Set the default aperture parameters and apidtable
apdemos	-	Various tutorial demonstrations
apedit	-	Edit apertures interactively
apfind	-	Automatically find spectra and define apertures
apfit	-	Fit 2D spectra and output the fit, difference, or ratio
apflatten	-	Remove overall spectral and profile shapes from flat fields
apmask	-	Create and IRAF pixel list mask of the apertures
apnormalize	-	Normalize 2D apertures by 1D functions
aprecenter	-	Recenter apertures
apresize	-	Resize apertures
apscatter	-	Fit and subtract scattered light
apsum	-	Extract 1D spectra
aptrace	-	Trace positions of spectra

ADDITIONAL HELP TOPICS

apbackground	-	Background subtraction algorithms
approfiles	-	Profile determination algorithms
apvariance	-	Extractions, variance weighting, cleaning, and noise model
package	-	Package parameters and general description of package

- **noao.twodspec.longslit:**

background	-	Fit and subtract a line or column background
extinction	-	Apply atmospheric extinction corrections to images
fitcoords	-	Fit user coordinates to image coordinates
fluxcalib	-	Apply flux calibration to images
identify	-	Identify features
illumination	-	Determine illumination calibration
reidentify	-	Reidentify features
response	-	Determine response calibration
setairmass	-	Compute effective airmass and middle UT for an exposure
setjd	-	Compute and set Julian dates in images
transform	-	Transform longslit images to user coordinates

Many of the tasks in the NOAO packages are visible in several different packages. Although these are the same tasks and provide the same functionality, the default parameters are often set differently to account for different instruments or uses.