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  ldsstweak May97 ing


LDSSTWEAK
These routines are written to avoid having to use LEXT to compute the
telescope tweak for LDSS field acquisition. At night, the operation of
three different program environments (ICL, IRAF, and LEXT) has proved
to be confusing, counter productive, and time consuming. With these
routines the tweak procedure can be done on LPSS3 from within IRAF. On
top of the operational advantages the routines operate faster than the
LEXT equivalent due to:
  - built-in windowing support
  - not having to transfer data over the network into LEXT
  - an optional 'rough' tweak, which is usefull if the stars
    don't fall in the mask holes at the first telescope pointing.

The LDSSTWEAK package consist of three tasks, which are designed to be
executed in the following order:
  - findwindow
  - roughtweak
  - finetweak


FINDWINDOW
Task 'findwindow' helps you find a suitable CCD window for doing the
telescope tweak with. Especially for the 2kx2k chips, windowing
decreases the readout time and can significantly reduce the time used
for the whole field acquisition process.

This task reads your LEXT catalog file to compute detector (X,Y)
positions of the fiducial stars, and advices on what window to use.

ROUGHTWEAK
The purpose of the interactive task 'roughtweak' is to find the first
rough tweak that will position the telescope such that the fiducial
stars fall inside the fiducial holes.  The task compares the chip
positions of the fiducial stars on an image taken WITHOUT a mask, with
the computed chip positions of the fiducial holes of the corresponding
mask. The difference in positions are then transformed into telescope
tweak parameters: offsets and rotation.

This task reads your LEXT catalog file to compute detector positions
of the fiducial holes, and uses 'imexamine' to find the centroids
of the stars on an image of the corresponding field.

FINETWEAK
The interactive task 'finetweak' is essentially the same as the LEXT
procedure 'find_tweak'. It compares chip positions of the fiducial
holes with that of the fiducial stars, and computes telescope tweak
parameters to bring the stars in the centre of the holes.

This task uses 'imexamine' to find the centroids of the stars and the
holes on an image of a field taken WITH the mask in position.  Your
LEXT catalog file is read to get the essential information needed for
computing the tweak parameters.

A good tweak fit needs no less than 3 stars. Nevertheless, a tweak can
be computed on only 2 stars.


EXAMPLE
1) To find a suitable CCD window for tweaking, do

        findwindow mycat.cat
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Then, if you havent done this already, change the CCD readout speed
to TURBO.

2) Take an image (RUN, not GLANCE) without mask, at the required
telescope position and rotator angle, and do

        roughtweak r222401 mycat.cat

Ask the TO to apply the recommended tweak (first the offset, then the
rotation). This tweak should ensure that your fiducial stars end up
inside the mask holes.

3) Take an image with the mask (RUN, not GLANCE), and do

        finetweak r222402 mycat.cat

and ask the TO to apply the recommended tweak (first the offset, then
the rotation). This tweak will bring the stars further to the centre
of the holes.

Iterate the last step (mask image & 'finetweak') until the stars
are in the centre of the holes.

4) Finally, reset the CCD window and readout speed.


TIME REQUIREMENTS
A lot less than doing it by hand.


BUGS
if you encounter bugs email John Telting, jht@ing.iac.es


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FORTRAN SOURCE
The above mentioned IRAF routines call FORTRAN programs LDSSPARSECAT,
LDSSPARSESET, LDSSTRANSFORM, and LDSSTWEAK.

LDSSPARSECAT
Reads out the essential bits of the catalog file for
tweak purposes:
  - Field centre coordinates
  - Position angle
  - Coordinates of fiducial stars

LDSSPARSESET
Reads out the essential bits of the 'lext.set' file
for tweak purposes:
  - SCALE            Scale at mask in arcsec/mm
  - FRED             Focal reduction ratio
  - XPIX,YPIX        Pixel size in microns
  - XCENTRE,YCENTRE  Chip field centre
  - ROTATION         Rotation of mask with respect to detector

LDSSTRANSFORM
Reads in output of LDSSPARSECAT and LDSSPARSESET to calculate
positions of fiducial stars on detector.

LDSSTWEAK
Performs a fit to compute the tweak to match two sets of detector
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(X,Y) coordinates. With the information from LDSSPARSESET it outputs
the tweak in arcsec (offsets) and degrees (rotation).  This program
should do the same as as LEXT command 'lfit/noscale/field'.


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REQUIRED ACTIONS FOR SUPPORT STAFF
The tweak scripts and programs require the 'lext.set' file to be set
up properly. After LDSS is put on Cass and the spectrograph has been
put in focus, an image with the matrix mask and a broad-band filter
(the filter holder will prevent scattered light) has to be taken.
Then, the LEXT procedure 'analyse_matrix' has to be run to find the
centre of LDSS in chip coordinates and to find the rotation of the
chip with respect to the matrix mask.

The result has to be stored in the 'lext.set' file which has to be
accessible to the 3 IRAF scripts running on lpss3.


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SEE ALSO
roughtweak, finetweak, findwindow
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