To achieve this goal of re-constructing the observing strategy of the PI, it is necessary to find out the exact displacement between any two exposures. There are two methods to compute the displacements among the images: by using the World Co-ordinate System (WCS) keywords normally stored in the header of the dataset, or via a cross-correlation technique. For WFPC2 exposures (more than 35,000 when writing this article), a number of problems arose while considering those two approaches:

• Before April 1996 the WCS keywords in the dataset fits header were not reflecting dithering strategy; even after that date, the WCS keywords are computed using phase two proposal information, that is, WCS values do not take into consideration what happened during the observation.

• Cross correlation of exposures would be difficult due to the presence of cosmic rays and depends on the signal-to-noise ratio of the features in the images.

These problems led to the impossibility to use any of those two methods in an automatic pipeline. Instead, to compute the offsets among all the exposures in the association, we decided to use the pointing information stored in the HST observation log files [2], informally called "jitter files".

The jitter files have proven to be by far more reliable than any other available source of pointing information [1]. Some keywords (GUIDEACT, LOCKLOSS, SLEWING, etc.) in the jitter files along with the standard deviations of the measurements (right ascension, declination, roll angle) are used to evaluate the pointing stability during the observation and the accuracy of the measurements [3].

Once the offsets (in right ascension and declination) are computed, it is easy to derive the shifts expressed in pixels via the knowledge of the spacecraft orientation (roll angle) and of the focal plane geometry through the Science Instrument Aperture File (siaf).

A WFPC2 association containing all the WFPC2 exposures of the requested region of the sky, belonging to the same proposal, taken in the same filter, having the same position angle, can hence be seen as the ultimate repository of the observing strategy (real CR-SPLIT, real POS-TARG) as attained by the telescope.

Via the web (http://archive.eso.org/wdb/wdb/hst/science/form) users browse through the associations, have a closer look at a specific association, and immediately see what are the shifts among the exposures belonging to it.

Furthermore, an astronomer interested in that association can issue a request and ask our archive system to not only re-calibrate each exposure in the association, but also to combine them (if the offsets do not exceed the imposed limit of 5 mas beyond which the PSF of the combined images is degraded) to get cosmic-ray-free products. All the steps of the association pipeline are documented in log files that can be retrieved along with all the other products.

References

[1] A. Micol, P. Bristow, B. Pirenne: "Association of WFPC2 Exposures"; 1997 HST Calibration Workshop, Space Telescope Science Institute, 1997, S. Casertano, et. al., eds.

[2] M. Lallo: "Observation Logs"; http://www.stsci.edu/ftp/instrument_news/Observatory/obslog/OL_l.html, Data Systems Operations Branch, Space Telescope Science Institute, July 1998.

[3] M. Dolensky et. al.: "How the analysis of HST engineering telemetry supports the WFPC2 association project and enhances FOS calibration accuracy", in this issue.

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Image from the VLT Science Verification Programme

The galaxy ESO342-G017 was observed on August 19, 1998 during a spell of excellent observing conditions. Two exposures, each lasting 120 seconds, were taken through a red filter to produce this photo. The quality of the original images is excellent, with FWHM of only 0.26 arcsec measured on the stars in the frame. The frames were flat-fielded and cleaned for cosmics before combination.

ESO342-G017 is an Sc-type spiral galaxy seen edge-on, and the Test Camera was rotated so that the disk of the galaxy appears horizontal in the figure. Thanks to the image quality, the photo shows much detail in the rather flat disk, including a very thin, obscuring dust band and some brighter knots, most probably star-forming regions. This galaxy is located well outside the Milky Way band in the southern constellation of Sagittarius. Its distance is about 400 million light-years (recession velocity about 7,700 km/sec). A number of more distant galaxies are seen in the background on this short exposure.

The field shown measures ~ 1.5 × 1.5 arcmin. North is inclined 38° clockwise from the top, east is to the left.

(Figure and caption are from the ESO web pages at http://www.eso.org/outreach/press-rel/pr-1998/pr-12-98.html *prepared by the ESO Education and Public Relations Department.)*