

Recent software developments at TERAPIX

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Outline

- TERAPIX and the CHTLS
- Access to software and support
- Development plan
- New developments during 2006 (->T04)
- Ongoing software developments (-> T05?)



The tasks of TERAPIX

- Develop and distribute software tools required for the processing of MEGACAM data
 - Pre-processing done at CFHT (**Elixir**)
 - TERAPIX software is developed in-house and can be used on various kinds of data
 - Released as Open Source to the community
- Manage data and hardware
 - Compute/storage farm of 24 bi-, quad-, and octo-procs for processing
 - 240 Gflops peak
 - Direct access to the data with 100+TB of redundant storage
 - Cluster of 8 bi-procs available on request for data-intensive CFHTLS science
- Produce and release calibrated, resampled, co-added images, weight maps and catalogs on a regular basis.
 - 4th release (10TB) about to start
 - The achieved re-processing cycle time is presently 12 months
 - Goal is 6 months
 - Each release benefits from
 - Extended coverage
 - Complete re-calibration with increasing overlaps
 - Software upgrades and new features
 - The VeryWide part of the CFHTLS absorbs 75% of TERAPIX resources
- Provide support to members of the Canadian and French communities
 - Process P.I programs on request





Access to software

- What is distributed:
 - source packages
 - Binary, static Linux RPMs (both x86 32 et 64 bits, single and multi-threaded)
 - PDF documentation
- Public unstable versions:
 - accessible through our SubVersion repository
 - <http://terapix.iap.fr/wsvn>
 - “on demand” re-packaging of intermediary versions





Getting help

- Discussion forums
 - <http://terapix.iap.fr/forum>
 - MEGACAM
 - CFHTLS
 - P.I.
 - WIRCAM
 - TERAPIX software
 - software for astronomy
 - hardware for astronomy
 - private forums
 - ask if you want own forum!

TERAPIX forum - Mozilla Firefox

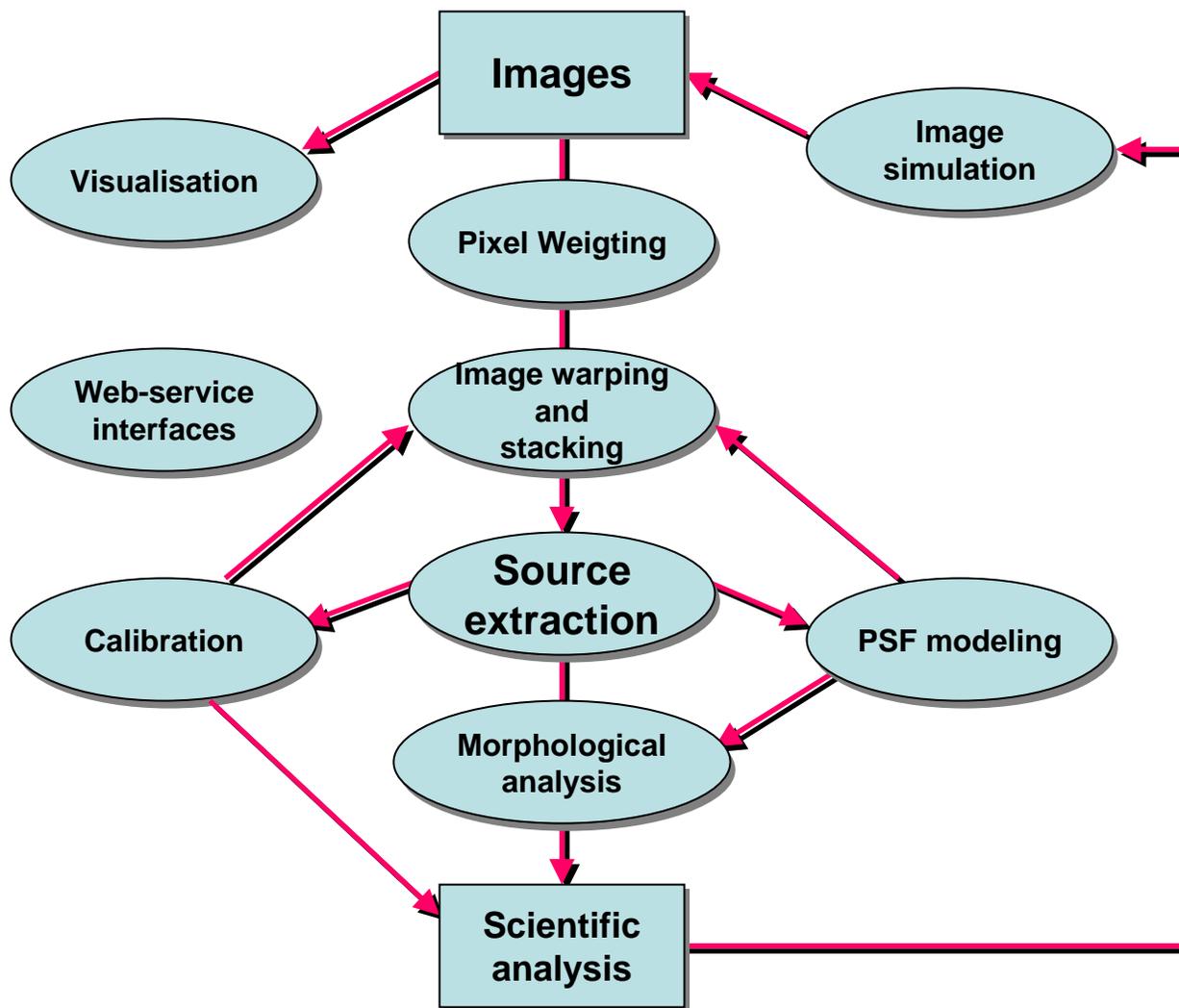
File Edit View Go Bookmarks Tools Help

http://terapix.iap.fr/forum/index.php

Forum	Threads	Posts	Last Post
Hardware for data processing	1	4	Intel Core 06-02-2006 14:44 By Emmanuel Bertin
Data products			
Forum	Threads	Posts	Last Post
CFHTLS CFHT Legacy Survey data	1	1	CFHTLS-F03 photometry re... 06-26-2006 15:34 By Henry Jey McCracken
MEGACAM P.I. programs	2	8	retrieve data from Terapi... 10-16-2006 16:39 By Henry Jey McCracken
WIRCAM P.I. programs	1	1	WIRCAM processing product... 08-07-2006 20:03 By Chien-Ming
others / open discussion	0	0	Never
Software products			
Forum	Threads	Posts	Last Post
Eye Eye (Enhance Your Extractor) generates non-linear image filters for SEExtractor using machine learning.	0	0	Never
SCAMP SCAMP reads SEExtractor catalogues and computes astrometric and photometric solutions for SWarp.	7	20	SCAMP V1.3.0 released! 10-13-2006 12:27 By joshua
SEExtractor SEExtractor extracts catalogues of objects from astronomical images.	29	101	defocused photometry 10-19-2006 17:58 By mcho
SkyMaker SkyMaker generates artificial astronomical images.	2	4	CCD Bleeding 08-12-2006 02:13 By Emmanuel Bertin
STIFF STIFF converts scientific FITS images to TIFF format	1	3	TIFF to FITS program avail... 06-05-2006 21:24 By joshua
Stuff Stuff generates artificial catalogs of astronomical sources for SkyMaker.	1	2	Random Star Generation 07-09-2006 18:07 By Emmanuel Bertin
SWarp SWarp resamples and combines FITS images in any arbitrary World-Cordinate-System: complete projection.	10	50	All stars in SWarped imag... 10-17-2006 19:09 By tgm12345

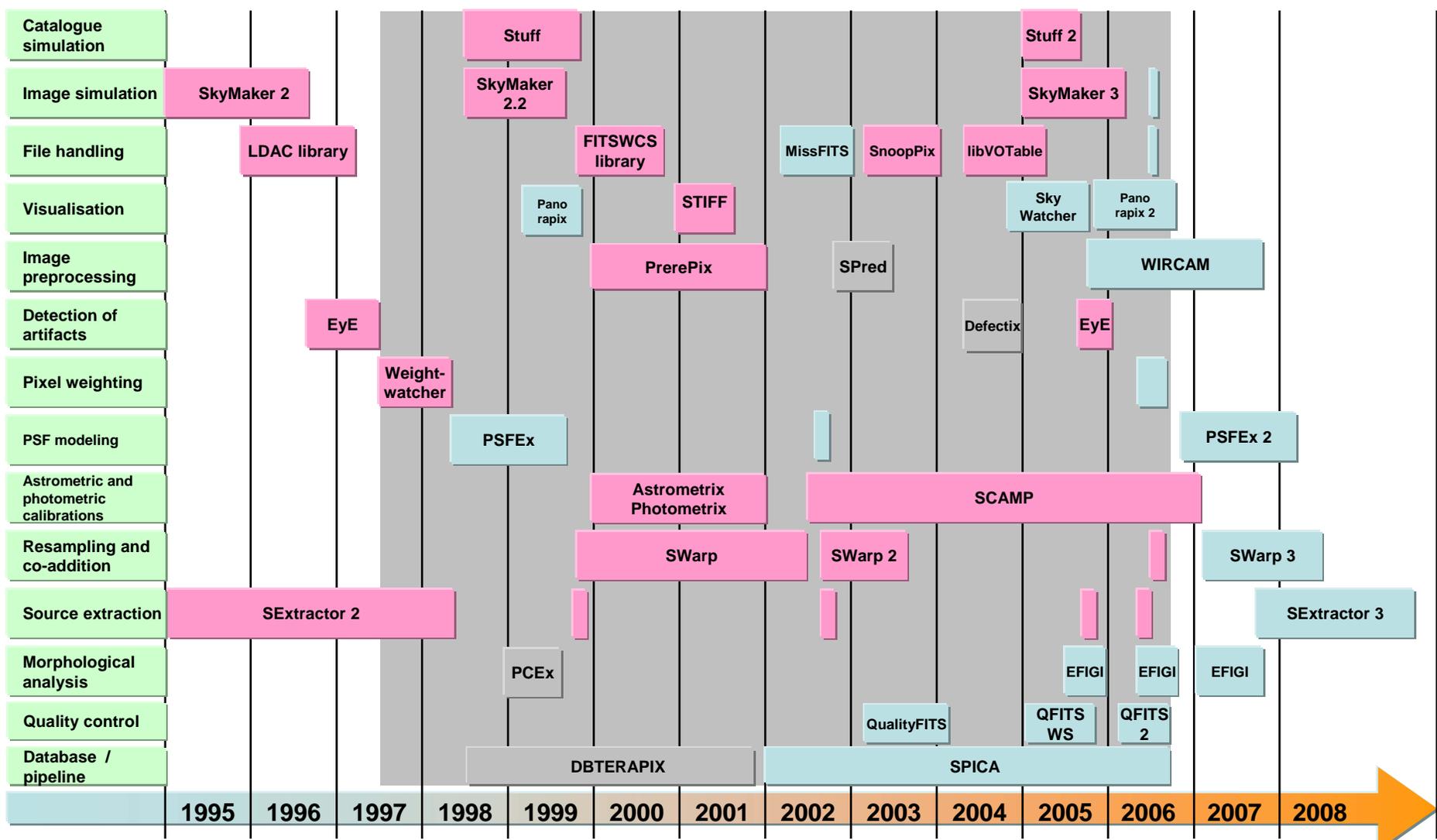


TERAPIX: An automated image analysis system





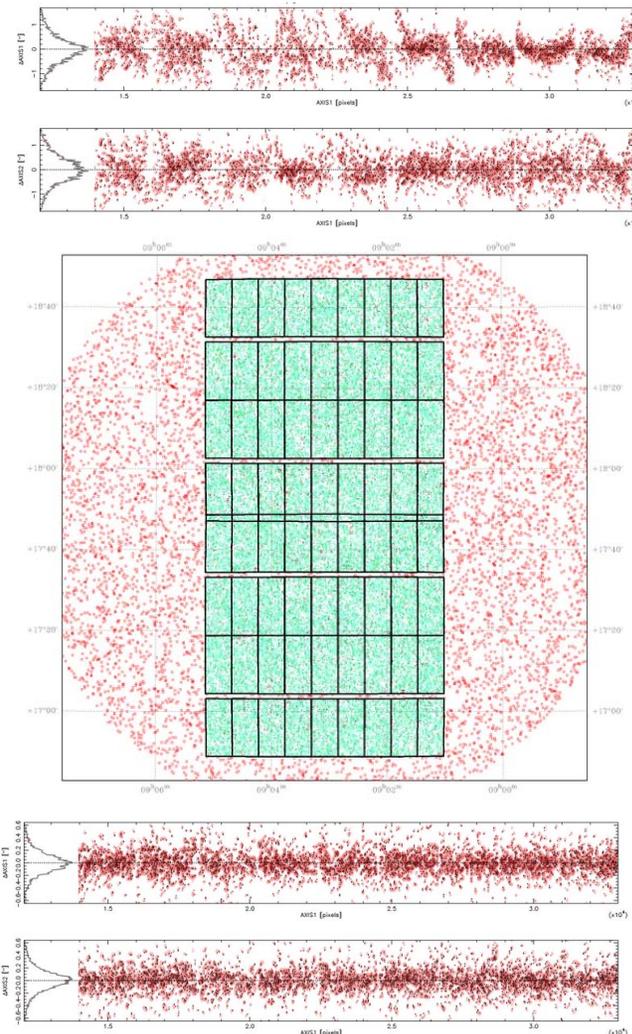
Development plan





New developments during 2006 (->T04)

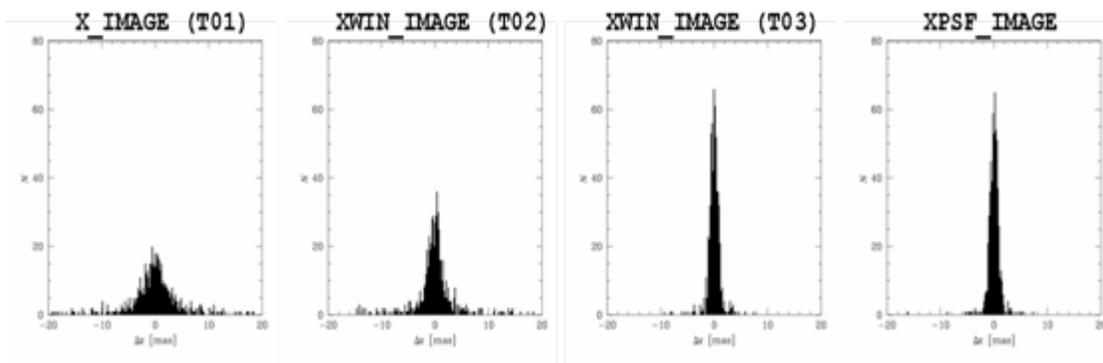
- Mostly improve robustness of the existing approaches
 - SCAMP (astrometric and photometric calibration software) released.
 - Average astrometric precision in T03:
 - 30mas RMS (pairwise) internal for sources with S/N > 100
 - 280mas RMS (pairwise) with respect to USNO-B1
 - testing by other users helped find bugs and improve algorithms
 - V1.3.2: recipes tuned to offer more robust behaviour in crowded fields and observing programs with poor dithering patterns.
 - balancing between internal and external positional constraints
 - Proper motions / light curves computed but not yet available in output
 - WIRCAM processing (C.Marmo)
 - helped discovering bugs and provided
 - QualityFITS improved (F.Magnard & C.Marmo)
 - Move to ICRS (at last)
 - XML-VOTable output of metadata
 - TERAPIX software used for various data challenges





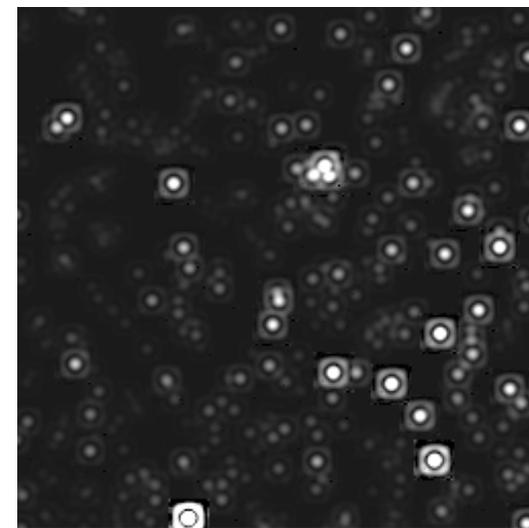
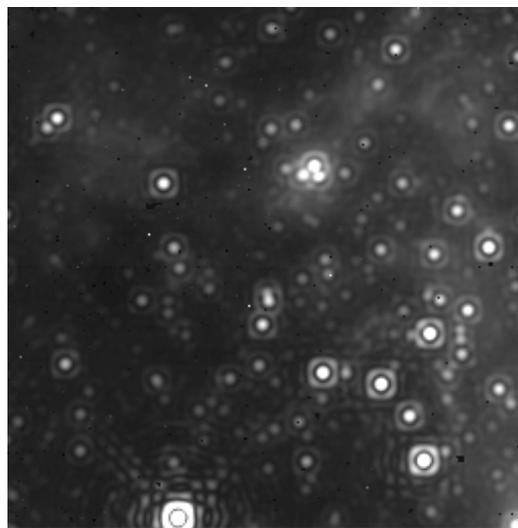
Ongoing software developments (-> T05?)

- PSF-fitting photometry
 - Mostly improve photometry
 - PSF modeling and fitting have been in there since 1999!
 - Improvements and testing done by the Grenoble team (Ph. Delorme)
 - Deblending issue: Extragalactic science vs galactic science
 - Clever filtering or use the current deblending algorithm
- Homogenisation of the PSF



original

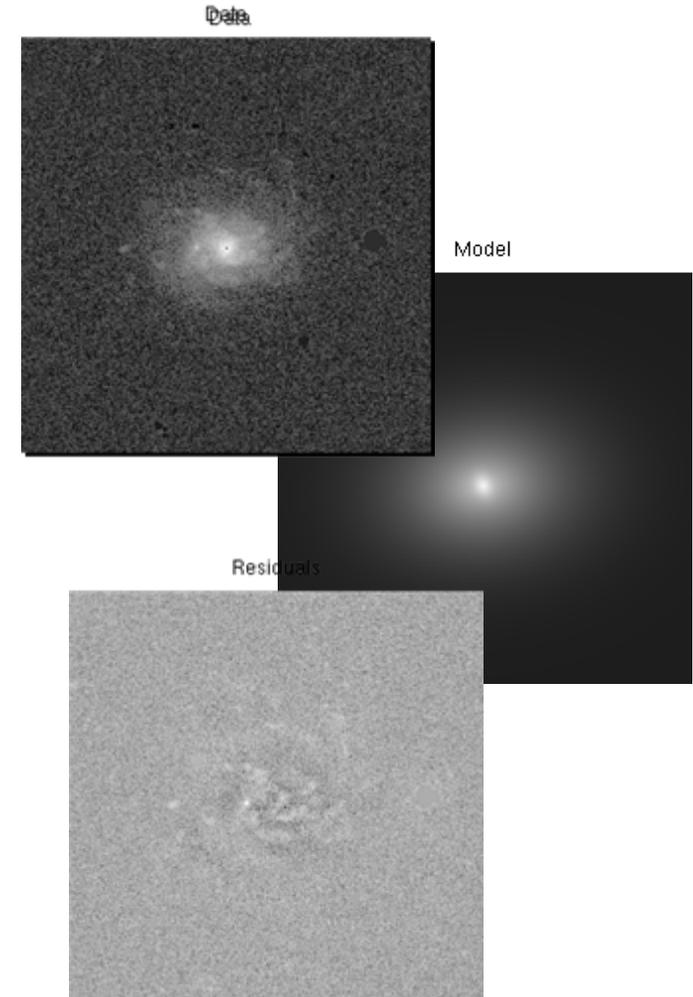
reconstructed





Ongoing software developments (-> T05?)

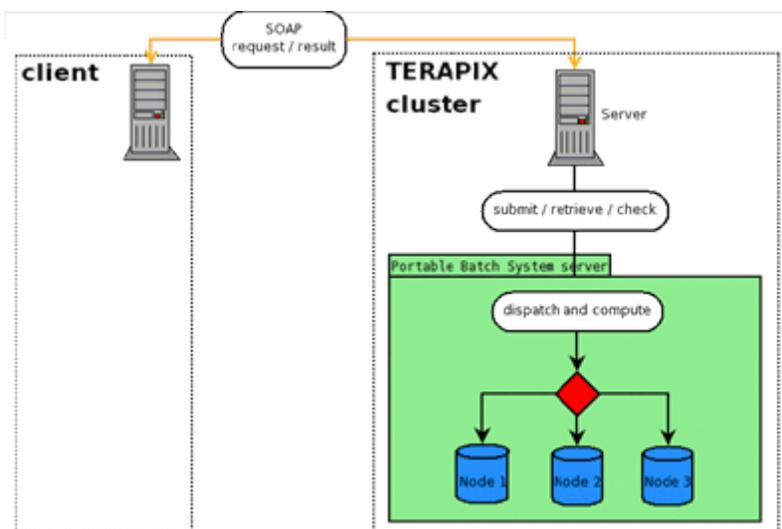
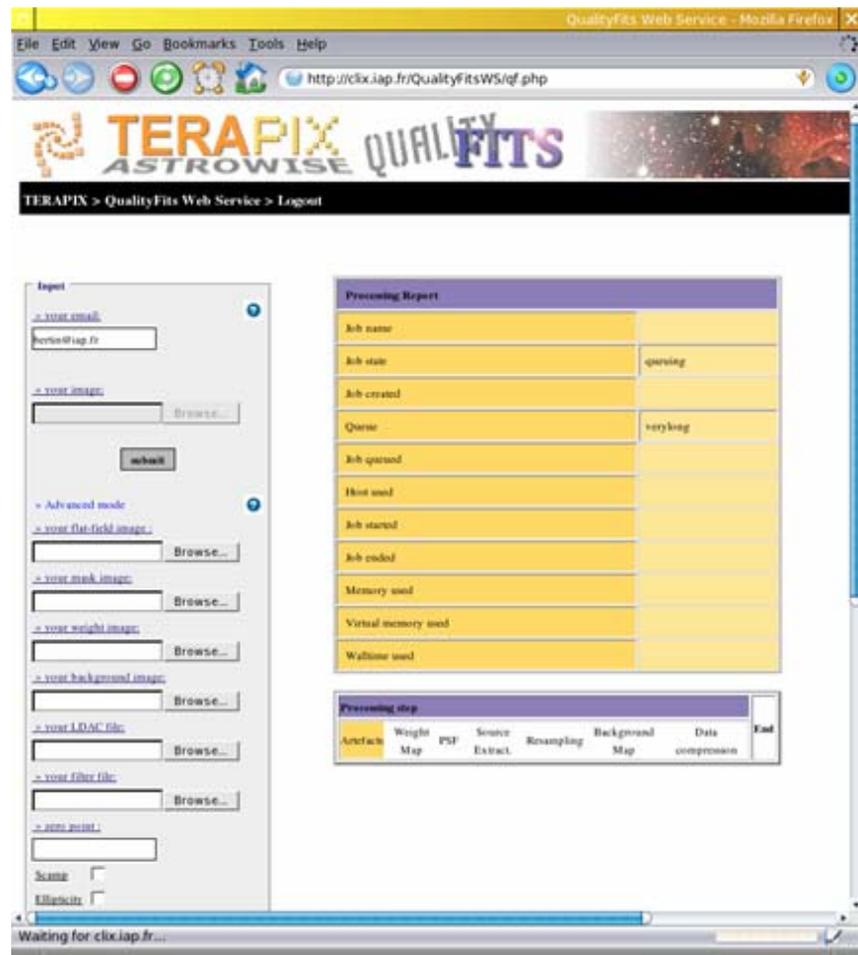
- Galaxy profile-fitting
 - Development done in the framework of the FIGI project (with M. Arroyo@LTCI)
 - Analytical profiles
 - Single Sersic
 - Sersic + exponential (12 free parameters)
 - Currently a few seconds per 2GHz core
 - Goal is <100ms per core
 - Detection of additional morphological attributes later (Q4 2007)
 - Suitability for lensing studies needs to be assessed





Web Services

- Step towards an online pipeline
- Offer computing time available on the TERAPIX pipeline cluster between releases
- Make programs that require a complex installation easier to use.
- Gigabit connection expected at IAP
- V.O. compliancy
- Restricted to tasks with a reasonable amount of I/Os
 - no coaddition of distant data
- Prototype developed by J.-C. Malapert
- Release date depends on available manpower





terapix.iap.fr/forum

