

Gaia non single stars

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On behalf of Gaia DPAC CU4 NSS

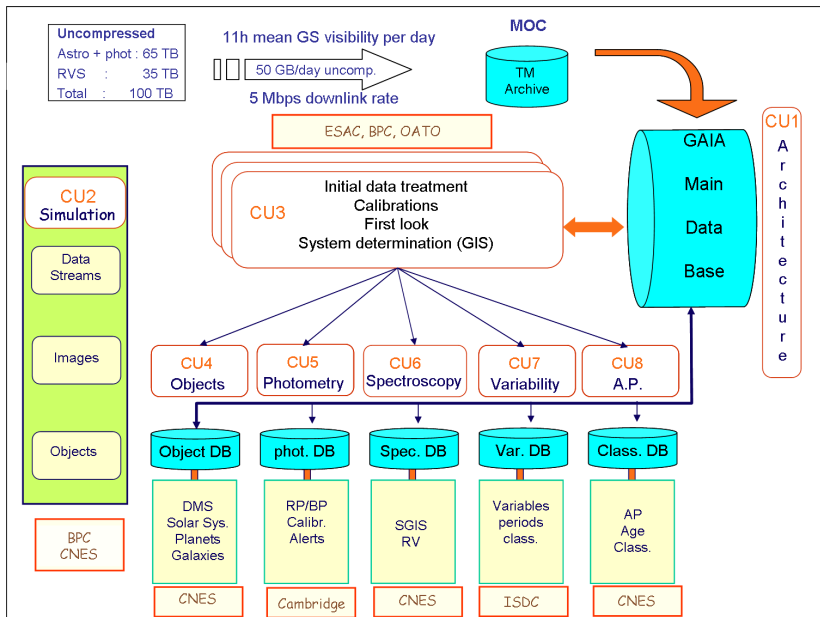


Gaia in a nutshell

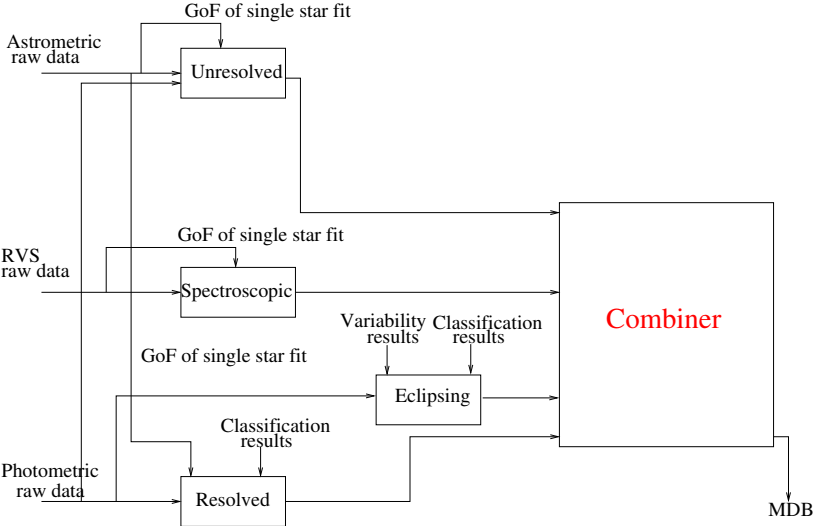
- ▶ Gaia is the ESA full sky astrometric spectro-photometric survey launched in December 2013;
- ▶ On-board detection down to 20.7 G-magnitude ($\sim 1\text{B}$ objects) in astrometry and photometry; 16th G magnitude in spectroscopy;
- ▶ Repeated observations (70 on average) over 5 years;
- ▶ No input catalogue so the very nature of every object observed is not known beforehand;
- ▶ Visit <http://www.cosmos.esa.int/web/gaia> for a broader presentation



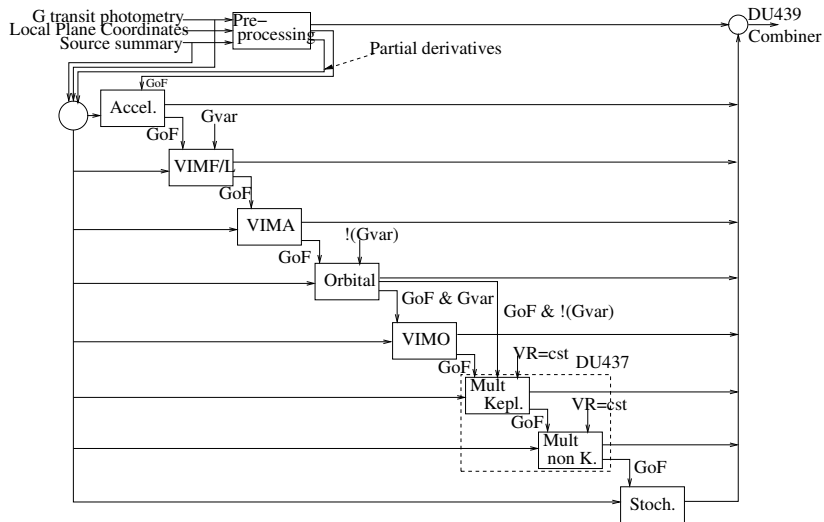
DPAC cascade



Detection and processing on the fly



[Un]resolved boxes blown up



DPAC [CU4 NSS] works for you!

From theory to practice

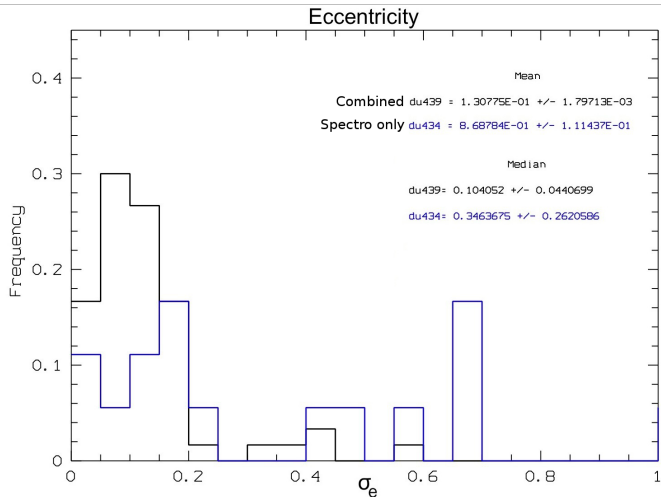
- ▶ 50% binaries, so 500M in Gaia output catalogue. % detected?
- ▶ State of the art simulation combined w/real processing pipeline!

Total number of objects analysed	10211374
Number of detected Astrom NSS	205045
Acceleration7	59212
Acceleration9	28372
VIMF	31010
VIML	365
VIMA2	36
VIMA4	226
Orbital	64851
VIMO	224
Stochastic	20482
SingleStar	270
Number of detected Spectro NSS	54394
Number of detected Eclipsing NSS	13592

- ▶ Assessment of
 - ▶ the simulation of
 - ▶ the distribution of types of objects
 - ▶ the behaviour of specific types
 - ▶ the detection of specific objects (resolved, ...)
 - ▶ the results
 - ▶ easy: Orbital vs Orbit
 - ▶ not so easy: non orbital vs Orbit



Benefit of combining



Even when only one branch gives an acceptable solution, combining the data sets can improve it.

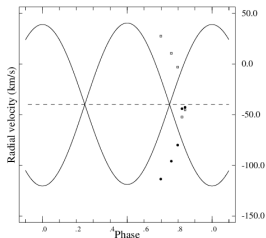
Conclusions

- ▶ Unlike Hipparcos, no input catalogue, so no way to tune the processing;
- ▶ Large scale simulations processed blindly greatly help;
- ▶ By the end of the decade, millions of orbital solutions (astrometric/visual, spectroscopic and/or photometric): how WDS and SB9 will handle them?
- ▶ In order to benefit from the Gaia solutions right away, some observation campaigns cannot wait any longer!

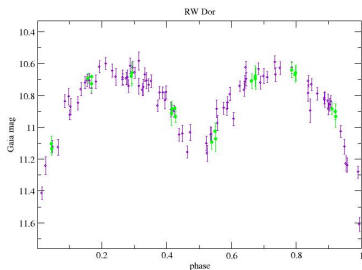


Fresh solutions from the pipeline

Although the input pipe is still dry, some results from upstream CU look promising (e.g. 3465 EB flagged by CU7 in OR5S2).



(Credit CU6; Griffin & Suchkov 2003)



(Gaia IW 20140715)

Taking advantage of the whole EPSL data set should yield some scientific results.

242 330 230 AGIS sources (EPSL), 526 EB detected by CU7 processed by NSS pipeline last week.