

# *RV standards objects for the GAIA-RVS*

*F. Crifo (Paris-Meudon, GEPI),  
A. Doressoundiram (Paris-Meudon LESIA),  
D. Hestroffer (Paris-IMCCE),  
G. Jasiewicz (Montpellier),  
D. Katz (Paris-Meudon, GEPI),  
C. Soubiran (Bordeaux),  
A. Siebert (Potsdam),  
S. Udry (Genève),  
T. Zwitter (Ljubljana)*

*CU6 - Bruxelles – F. Crifo, page 1/15*

## *Objects examined*

2 types of objects examined,  $V \leq 10$ :

- Bright asteroids,
- « Stable » stars,  $6 \leq V \leq 10$ ,  
stable in RV and photometry

*CU6 - Bruxelles – F. Crifo, page 2/15*

## Asteroids-1

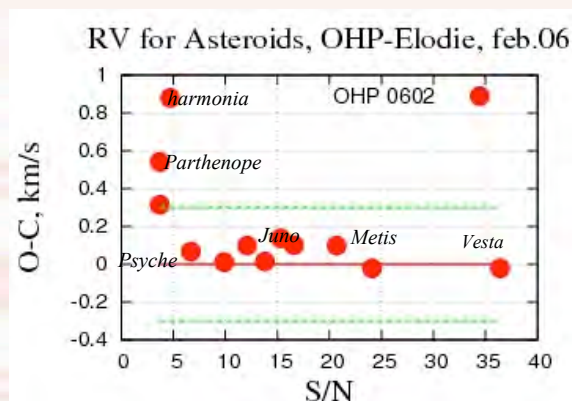
- 1<sup>st</sup> suggestion made by T. Zwitter in 2003, see Livelink, UNILJ/GAIA-RVS/TN/001.01
  - Observations at the Asiago telescope, 2004-2005;
  - Paper now accepted in A&A (Zwitter, Mignard & Crifo), already available on astro-ph;
- Main confirmation: asteroids can be used as wavelength standards

CU6 - Bruxelles – F. Crifo, page 3/15

## Asteroids-2

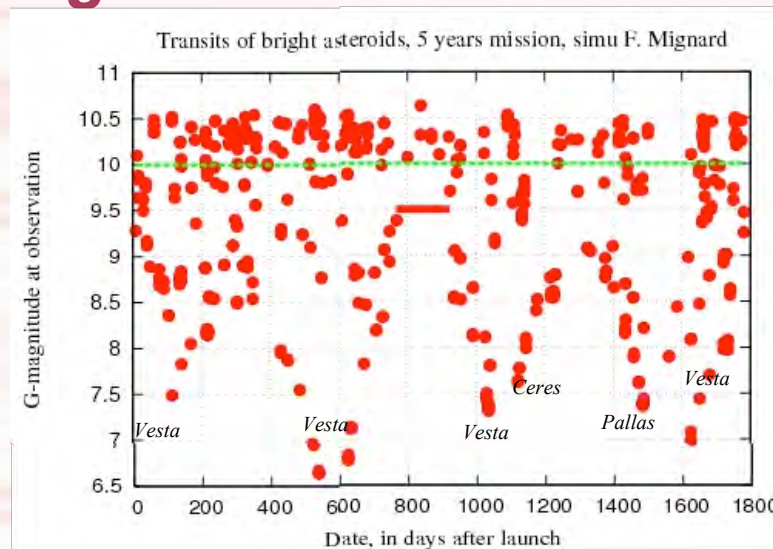
- ☒ 1<sup>st</sup> observing run at OHP-Elodie, feb.06 , by C. Soubiran:

O-C = difference between observed and calculated RV (calculations by D. Hestroffer), vs S/N:



CU6 - Bruxelles – F. Crifo, page 4/15

## Bright asteroids for the RVS?



Asteroids are observed with some phase angle, NEVER at opposition.  
Longest period WITHOUT bright asteroid: 156 days = 5.2 months

CU6 - Bruxelles - F. Crifo, page 5/15

## Reference stars: present list

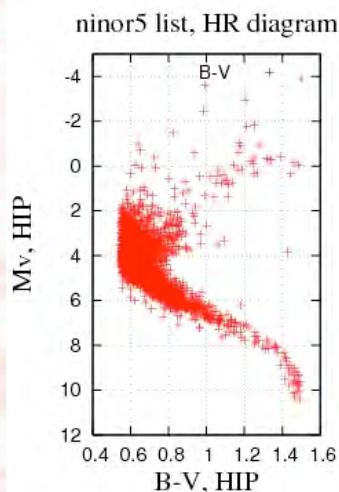
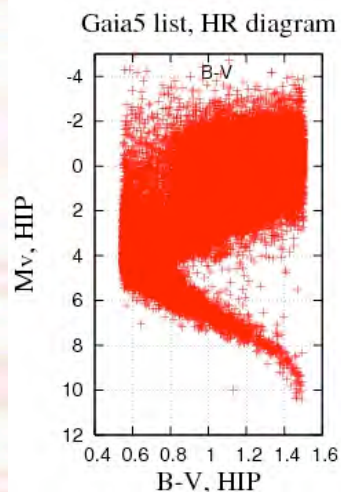
- Present list of proposed objects:  
 $6 \leq V \leq 10$ , «good» HIP objects from Nidever02 and Nordstrom04,  $\sigma_{RV} \leq 300$  m/s:  
2535 stars: 457Nid + 2300 Nord -222 common
- Comparison of RVs: small offset of Nord with respect to Nid and UAI standards  
=> update of the Nord list, just started by J. Holmberg, should solve the problem.

CU6 - Bruxelles - F. Crifo, page 6/15

## Reference star list (2)

➤ **Contents of the list:**

only FEW giants, as Nord04 is for solar neighborhood.



*Giants with  
 $B-V < 1.5$  could be a  
good source.*

CU6 - Bruxelles – F. Crifo, page 7/15

## Reference stars (3)

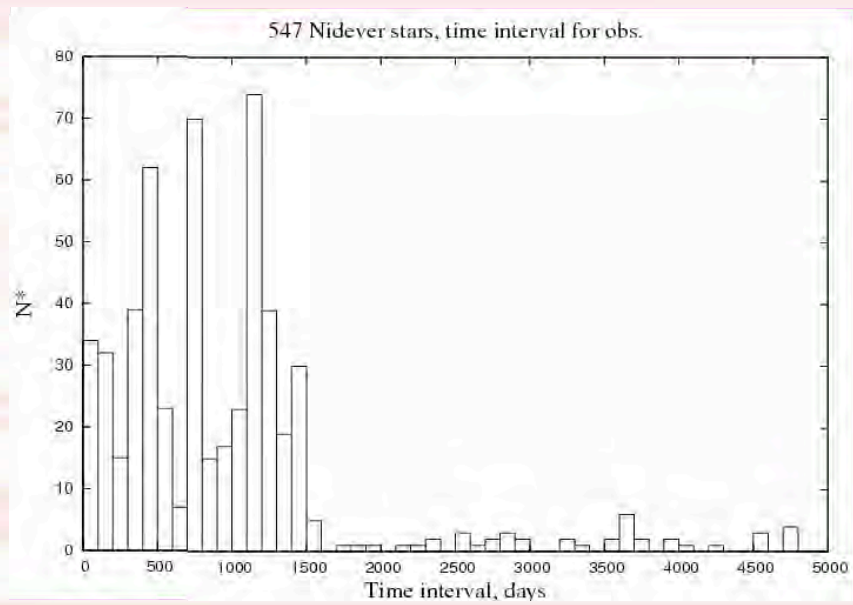
How good are the reference stars? (number of obs, time span)

- **Nidever:** « ...the stars each typically have ~12 spectra obtained during 4 years, from 1997 to 2001... »
- Histogram of span of observations; Nmes not available;
  - Observations ended in 2001: too early for RVS
- **Nordstrom:** diagram (span of obs, Nmes):
- half of the stars have only 2 measurements
  - end of obs: mixture of lists

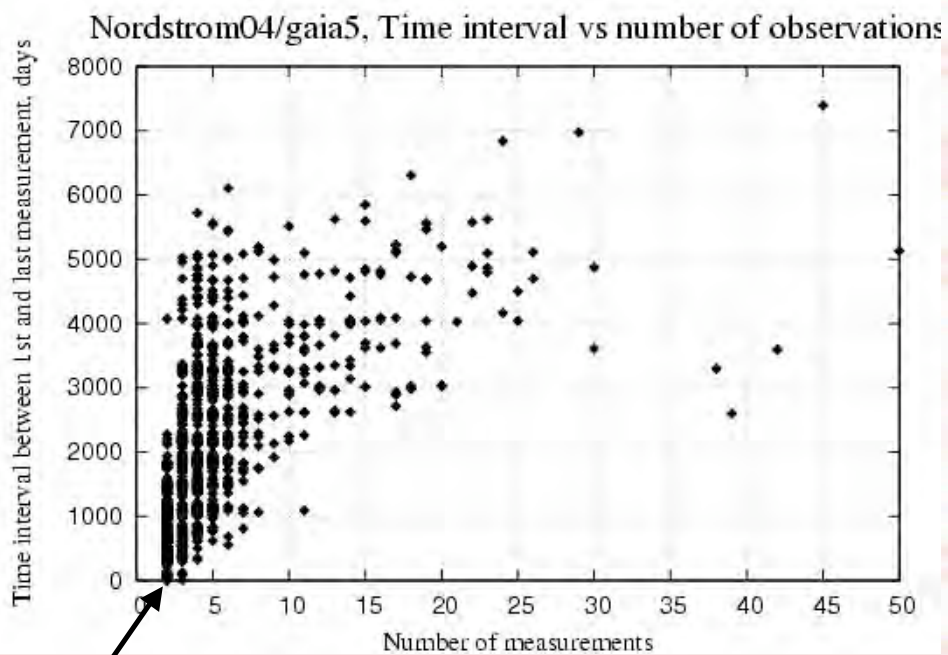
CU6 - Bruxelles – F. Crifo, page 8/15



## *Nidever02, time interval*



*CU6 - Bruxelles - F. Crifo, page 9/15*



*Half of the points are in this column*

*CU6 - Bruxelles - F. Crifo, page 10/15*

## ***Conclusion for existing data***

- For the available data:
- Not enough measurements per star;
- Too short time span;
- Existing observations finished 10-15 years before launch
- **=> *New measurements absolutely necessary!***

*CU6 - Bruxelles – F. Crifo, page 11/15*

## ***Database***

- Need for storing all data new observations, literature...):
- A new database will be very helpful!
- Prepared by A. Siebert (Potsdam)
- Web interface
- In common for CU6 and CU8?

*CU6 - Bruxelles – F. Crifo, page 12/15*





# GAIA CU6/8

## External Database

(UNDER CONSTRUCTION)

DATA (BOTH RVs AND STELLAR PARAMETERS) NEED TO BE COLLECTED TO PREPARE THE GAIA MISSION AND VALIDATE ITS OUPUT

- NEED FOR A DATABASE TO STORE AND ACCESS THOSE DATA

### WHAT NEEDS TO BE STORED :

<u>BASIC DATA</u>	<u>DESCRIPTION OF THE OBSERVATION</u>	<u>RV MEASUREMENT</u>	<u>STELLAR PARAMETERS</u>
Identifiers Photometry Position Proper motion Parallaxes Spectral type Variability ...	Target identifiers Telescope Instrument Resolution Observing conditions Date of the observation Path to data Peculiarities ...	Identifiers RV RV error Method used Template used Observation used Correlation (?) Chi Square (?) Date of the observation ...	Identifiers Parameters (log g, Teff...) Errors Method used Observation used ...



# GAIA CU6/8

## External Database

(UNDER CONSTRUCTION)

DATA (BOTH RVs AND STELLAR PARAMETERS) NEED TO BE COLLECTED TO PREPARE THE GAIA MISSION AND VALIDATE ITS OUPUT

- NEED FOR A DATABASE TO STORE AND ACCESS THOSE DATA

### WHAT NEEDS TO BE STORED :

<u>BASIC DATA</u>	<u>DESCRIPTION OF THE OBSERVATION</u>	<u>RV MEASUREMENT</u>	<u>STELLAR PARAMETERS</u>
Identifiers Photometry Position Proper motion Parallaxes Spectral type Variability ...	Target identifiers Telescope Instrument Resolution Observing conditions Date of the observation Path to data Peculiarities ...	Identifiers RV RV error Method used Template used Observation used Correlation (?) Chi Square (?) Date of the observation ...	Identifiers Parameters (log g, Teff...) Errors Method used Observation used ...

Based on gaia5 but updates of the list must be possible





# GAIA CU6/8

## External Database

(UNDER CONSTRUCTION)

DATA (BOTH RVs AND STELLAR PARAMETERS) NEED TO BE COLLECTED TO PREPARE THE GAIA MISSION AND VALIDATE ITS OUPUT

- NEED FOR A DATABASE TO STORE AND ACCESS THOSE DATA

### WHAT NEEDS TO BE STORED :

<u>BASIC DATA</u>	<u>DESCRIPTION OF THE OBSERVATION</u>	<u>RV MEASUREMENT</u>	<u>STELLAR PARAMETERS</u>
Identifiers Photometry Position Proper motion Parallaxes Spectral type Variability ...	Target identifiers Telescope Instrument Resolution Observing conditions Date of the observation Path to data Peculiarities ...	Identifiers RV RV error Method used Template used Observation used Correlation (?) Chi Square (?) Date of the observation ...	Identifiers Parameters (log g, Teff...) Errors Method used Observation used ...

Description of all observations in the database + path to the data if in the archive



# GAIA CU6/8

## External Database

(UNDER CONSTRUCTION)

DATA (BOTH RVs AND STELLAR PARAMETERS) NEED TO BE COLLECTED TO PREPARE THE GAIA MISSION AND VALIDATE ITS OUPUT

- NEED FOR A DATABASE TO STORE AND ACCESS THOSE DATA

### WHAT NEEDS TO BE STORED :

<u>BASIC DATA</u>	<u>DESCRIPTION OF THE OBSERVATION</u>	<u>RV MEASUREMENT</u>	<u>STELLAR PARAMETERS</u>
Identifiers Photometry Position Proper motion Parallaxes Spectral type Variability ...	Target identifiers Telescope Instrument Resolution Observing conditions Date of the observation Path to data Peculiarities ...	Identifiers RV RV error Method used Template used Observation used Correlation (?) Chi Square (?) Date of the observation ...	Identifiers Parameters (log g, Teff...) Errors Method used Observation used ...

Description of the RV measurement (source and result) and quality control infos





# GAIA CU6/8 External Database (UNDER CONSTRUCTION)

DATA (BOTH RVs AND STELLAR PARAMETERS) NEED TO BE COLLECTED TO PREPARE THE GAIA MISSION AND VALIDATE ITS OUTPUT

- NEED FOR A DATABASE TO STORE AND ACCESS THOSE DATA

## WHAT NEEDS TO BE STORED :

### BASIC DATA

Identifiers  
Photometry  
Position  
Proper motion  
Parallaxes  
Spectral type  
Variability  
...

### DESCRIPTION OF THE OBSERVATION

Target identifiers  
Telescope  
Instrument  
Resolution  
Observation date  
Date of the observation  
Path to data  
Peculiarities  
...

### RV MEASUREMENT

Identifiers  
Description of the stellar parameters measurement (source and result) and quality control infos  
Chi Square (?)  
Date of the observation  
...

### STELLAR PARAMETERS

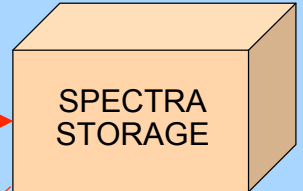
Identifiers  
Parameters (log g, Teff...)  
Errors  
Method used  
Observation used  
...

Description of the stellar parameters measurement (source and result) and quality control infos



# GAIA CU6/8 External Database

## LOCAL DISK STORAGE



## TOMCAT AND APACHE SERVERS

DATABASE UPDATE

LIST QUERY

OBJECT QUERY

CONE SEARCH

GET STATISTICS

## POSTGRES DATABASE

BASIC DATA

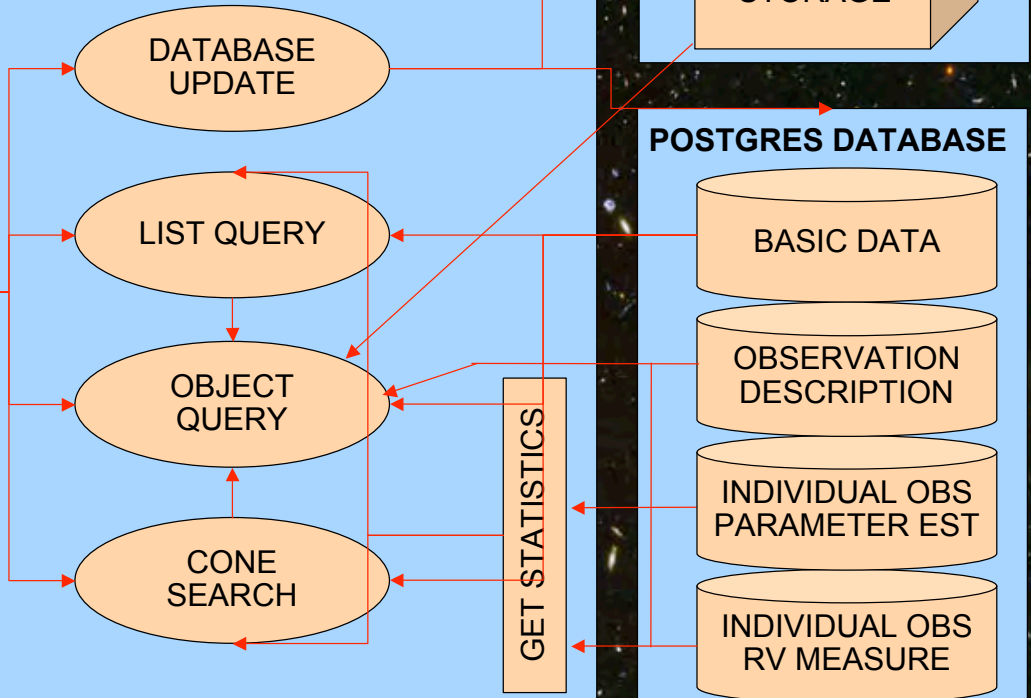
OBSERVATION DESCRIPTION

INDIVIDUAL OBS PARAMETER EST

INDIVIDUAL OBS RV MEASURE

EXTERNAL USERS

WWW INTERFACE



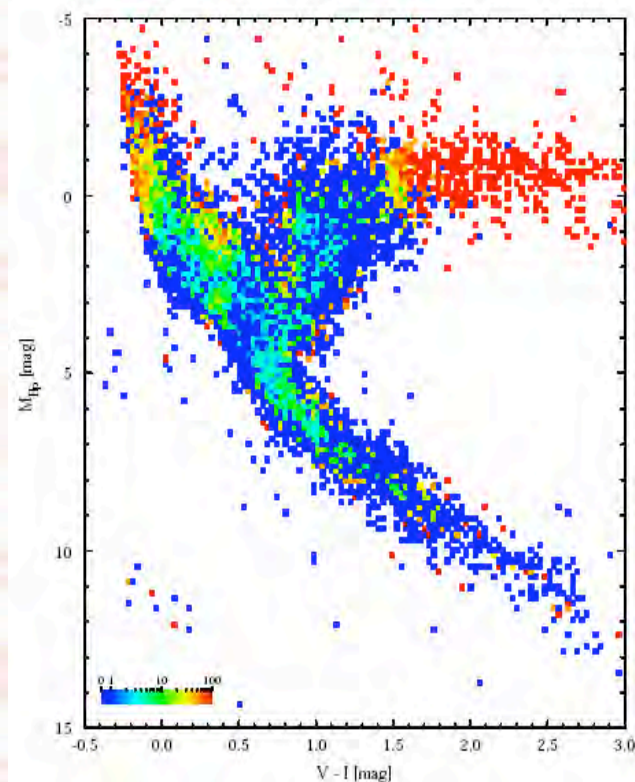
***THE END!!!***

CU6 - Bruxelles – F. Crifo, page 19/15

**Variability from Hipparcos:**

**Hipparcos HR diagram in (V-I), showing the percentage of variable stars in each elementary square.**

**The RVS reference stars should be selected in the blue or green areas.**



CU6 - Bruxelles – F. Crifo, page 20/15