Gaia Parameter Database

http://www.rssd.esa.int/gaia/paramdb

J. de Bruijne, U. Lammers, M. Perryman

[Access to the database requires a login & password. Contact gaialib@rssd.esa.int for the relevant info.]

Gaia Parameter Database: Purpose

- The Gaia parameter database is a controlled, up-to-date repository of all parameters relevant to Gaia.
- The database contains satellite design, mathematical, physical & astronomical constants and parameters (scalar & multi-dimensional).
- Harmonise the parameters used in work performed by >10 industrial contractors, >20 working groups,….
- To be used by scientific, technical & industrial communities (GDAAS, GASS already implementing it).

Gaia Parameter Database: Features I

- Actively maintained at ESTEC
- Reflects the most up-to-date & scientifically accurate status of Gaia parameters (~1500 entries)
- Contains fundamental & derived parameters, categorized as:
  Ground Segment, Satellite, Mission, Astro, Spectro, Nature
- Contains scalar & multi-dimensional data sets
- Approved by Gaia Science Team and relevant Working groups

Example of Content

- BBP CCD depletion thickness
- Rest-frame QSO spectrum
- Density of SiC at room temperature
- Number of serial windows in AF11
- Silver mirror coating transmission
- Focal length Spectro telescope
- Size on-board solid-state-mass-memory
- Ground-station availability requirement
- MBP PSF

Gaia Parameter Database: Features II

- Web-based interface **http://www.rssd.esa.int/gaia/paramdb**
- Requires login/password [username: gaiaparam, password: gaia$param]
- Access on-line (browser) or off-line (eg wget)
- Search or browse access (live version only)
- Choice of output formats:
  - html
  - xml
  - Fortran-77, -90
  - ANSI-C
  - C++
  - Java
  - CSV (comma separated values)
  - LateX, pdf

Gaia Parameter Database: Technical

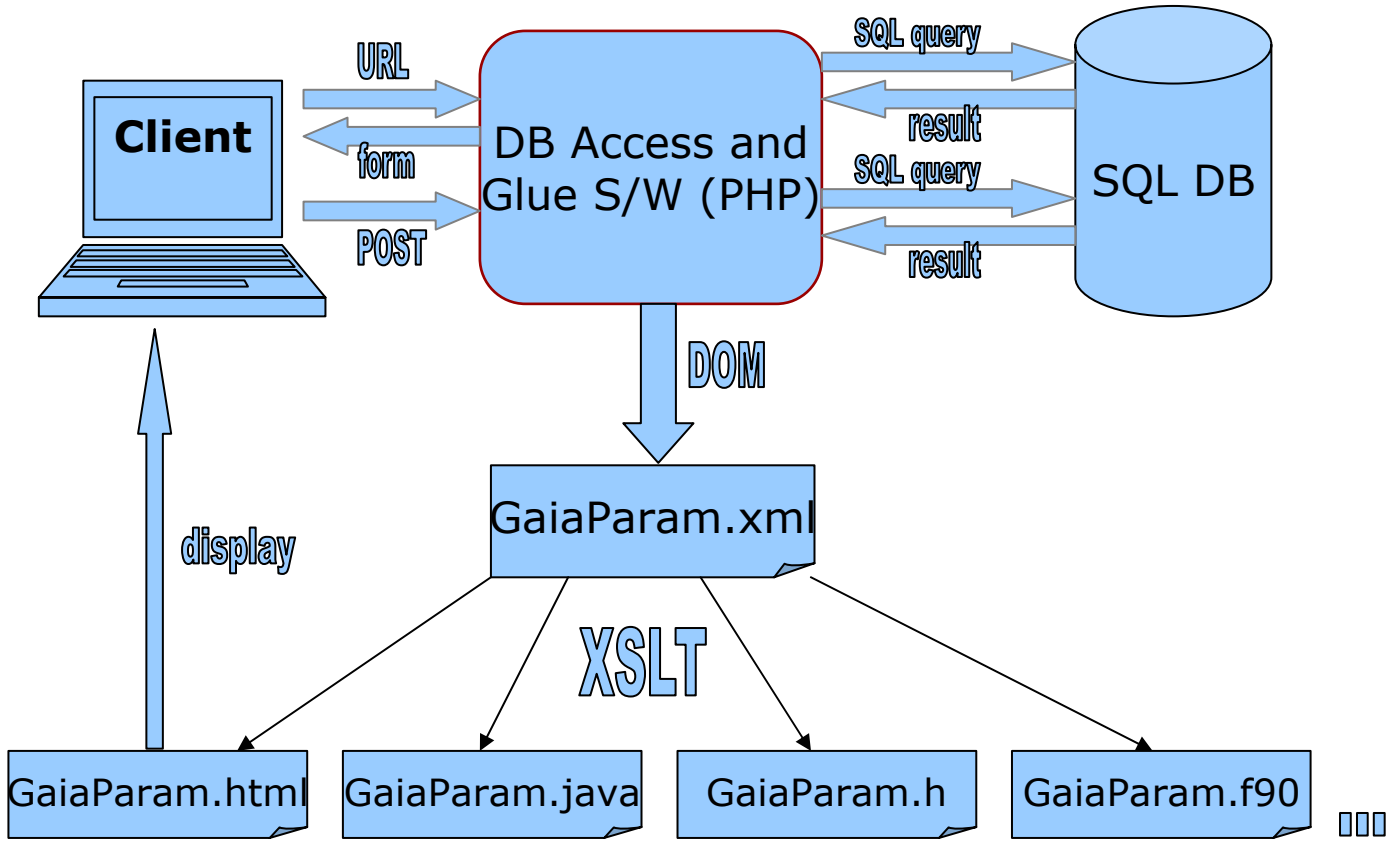
- The Database is based on a SQL-based database
- Access to DB via Web form offering search functionality
- Software to
  - Dynamically interact with search form
  - Bi-directional DB interaction
  - Rendering of query results via XML/XSLT
- Hierarchical breakdown of Gaia
- Compose parameter name as

  PATH:CLASS[_KIND][_DIRECTION][_CASE]

  Example:

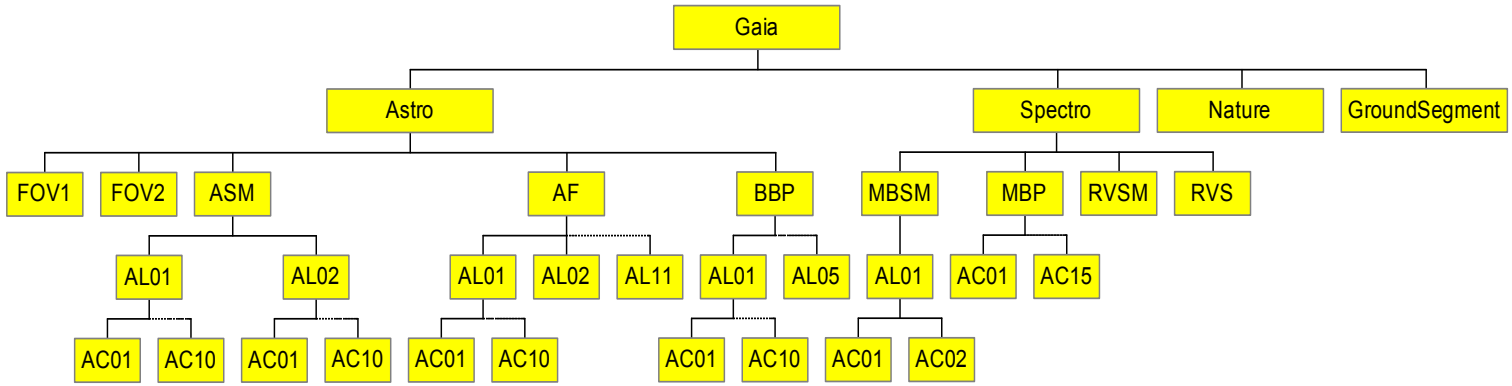
  :Spectro:RVS:??

Gaia Parameter Database: Technical



Hierarchical Breakdown

L1:
L2:
L3:
L4:

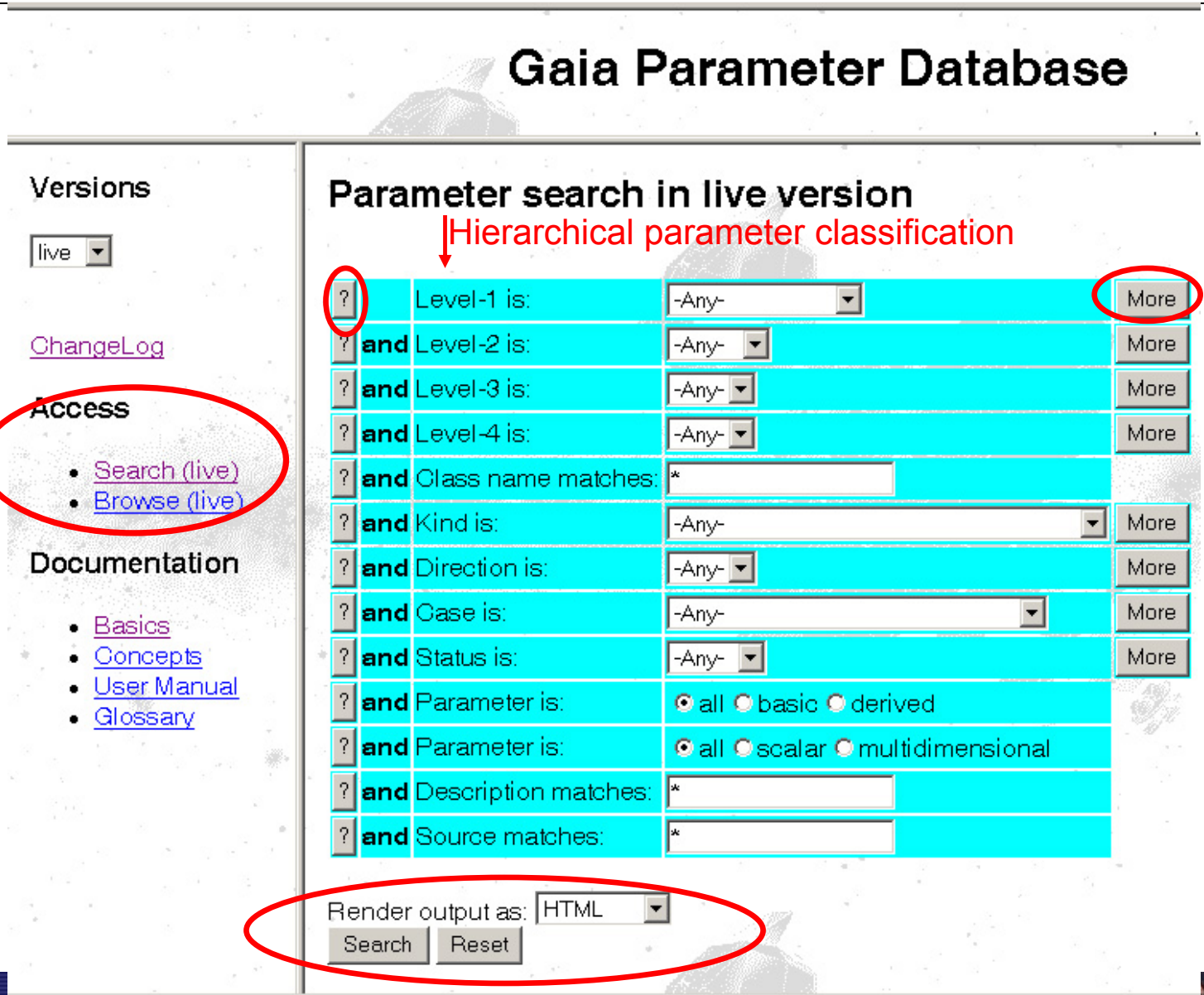


Example path: :Spectro:RVS:

Types of Data

1. Scalar data ("numbers")
   - Basic parameters
     - ✓ Measured parameters M_Sun=1.9888E+30 kg
     - ✓ Defining constants c=299792458 m/s
     - ✓ Nominal/design parameters ω=60"/s
     - ✓ Adopted parameters R_V=3.15
   - Derived parameters
     - ✓ Calculated for each query (double precision)
2. Multi-dimensional data ("files")
   - FITS format
   - Download file or display contents graphically

Gaia Parameter Database: www interface



Gaia Parameter Database: sample query

- Simple query for demonstration purposes:
- How many CCDs in the AF field?
  - Choose: Level 1 = “Astro”
  - Choose: Level 2 = “AF”
  - Choose: Kind = “number”
  - Choose: Status = “confirmed”

The latter two options serve to refine the query but are not mandatory.

Gaia Parameter Database: Results

Parameter name

Status: confirmed, TBC, TBD

Long description

Parameter search results (DB Version: -live-:2004-04-13T22:54:31)

Name	Value	Unit	Basic	Scalar	Status	Description	Source	Expression	LaTeX label	Last modifie
:Astro:AF:CCD_Number_AL	11		true	true	CONF	Number of CCDs in AF in the along-scan direction (i.e., number of CCD strips in AF)	Astrium, 15 January 2004, 'Astro focal plane assembly: requirements specification, compliance matrix, and verification matrix', GaiaFPA.SP.00147.T.ASTR, issue 3, revision 1, Requirement FPA120			2004-03 01T09:0
:Astro:AF:CCD_Number	110		false	true	CONF	Number of CCDs in AF		CCD_Number_AL * :Astro:CCD_Number_AC		2004-03 01T09:0

Basic or derived parameter

Source of the value

Expression: if it is a derived parameter

Gaia Parameter Database: multi-dimensional data

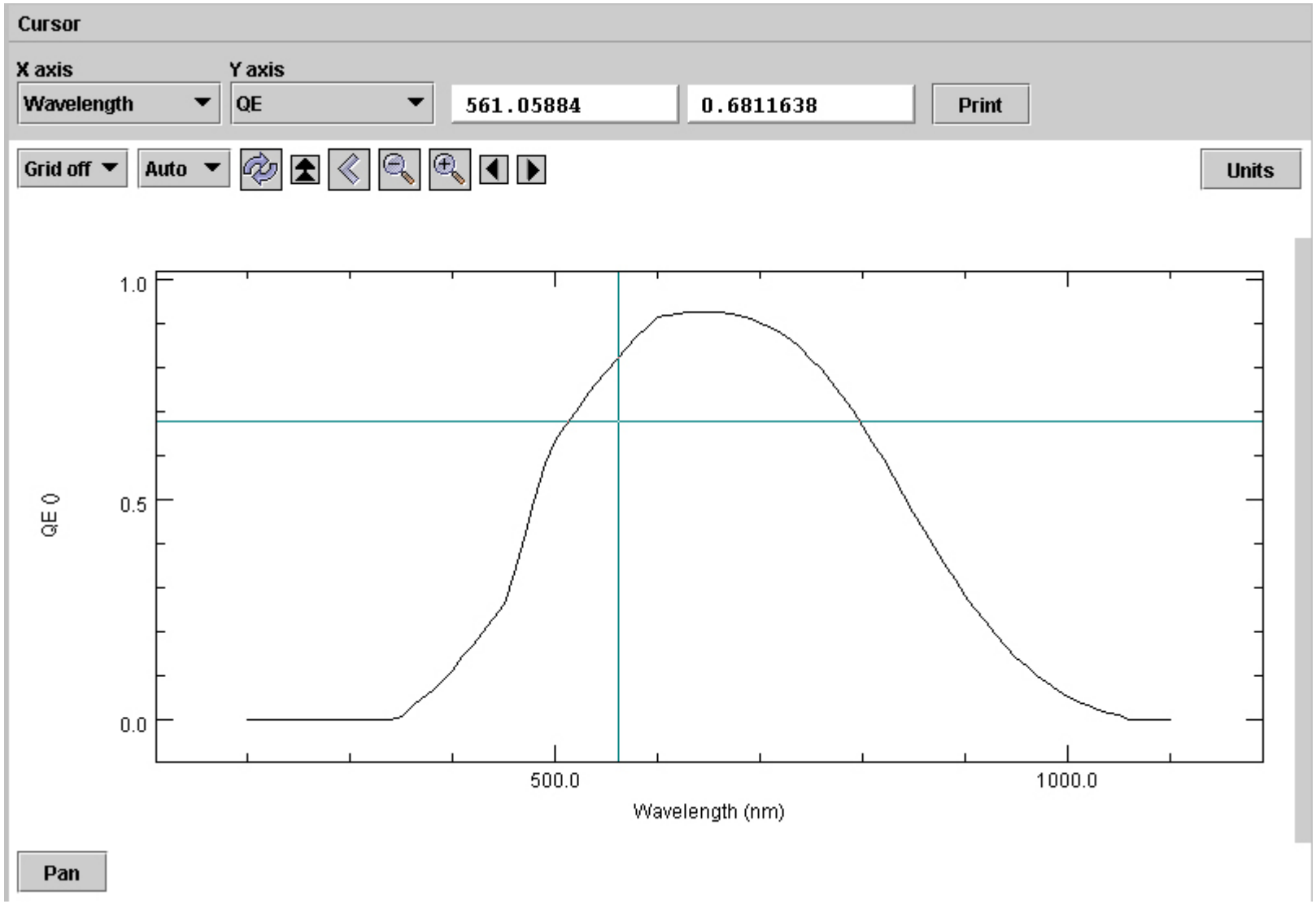
- Simple query for demonstration:What is the QE for the Astro CCDs? Choose Level 1 = “Astro”, Kind = “QE”

Name	Value	Unit	Basic	Scalar	Status	Description	Source	Expression	LaTeX label	Last modified
:Astro:CCD_QE_160K	Download Plot		true	false	CONF	CCD quantum efficiency (QE), as modeled by e2v technologies, for T = 160 K. First column: wavelength \lambda (in nm; from 200.0 to 1100.0). Second column: QE, at T = 160 K. Note that the QE for \lambda = 350, 360, 370, 380, and 390 nm has been changed from 0.081, 0.080, 0.084, 0.096, and 0.105 (original) to 0.010, 0.030, 0.050, 0.070, and 0.090 (present). This change, although leading to somewhat conservative QE estimates, removes the discontinuity around \lambda = 400 nm that is present in the original e2v-modelled data	T. Eaton and D. Morris (e2v technologies), 16 April 2003, 'Astro/AF & Spectro/MBP CCDs performance assessment report', Gaia-e2v-RP-006, issue 3, Appendix 4.2, p. 21 (device total thickness t = 16 micrometer and AR coating centered on 650 nm). See also A. Short, J.H.J. de Bruijne, 26 September 2003, 'CCD QE and MTF', Gaia-AS-002		QE (\lambda)	2004-03-01T09:00:00

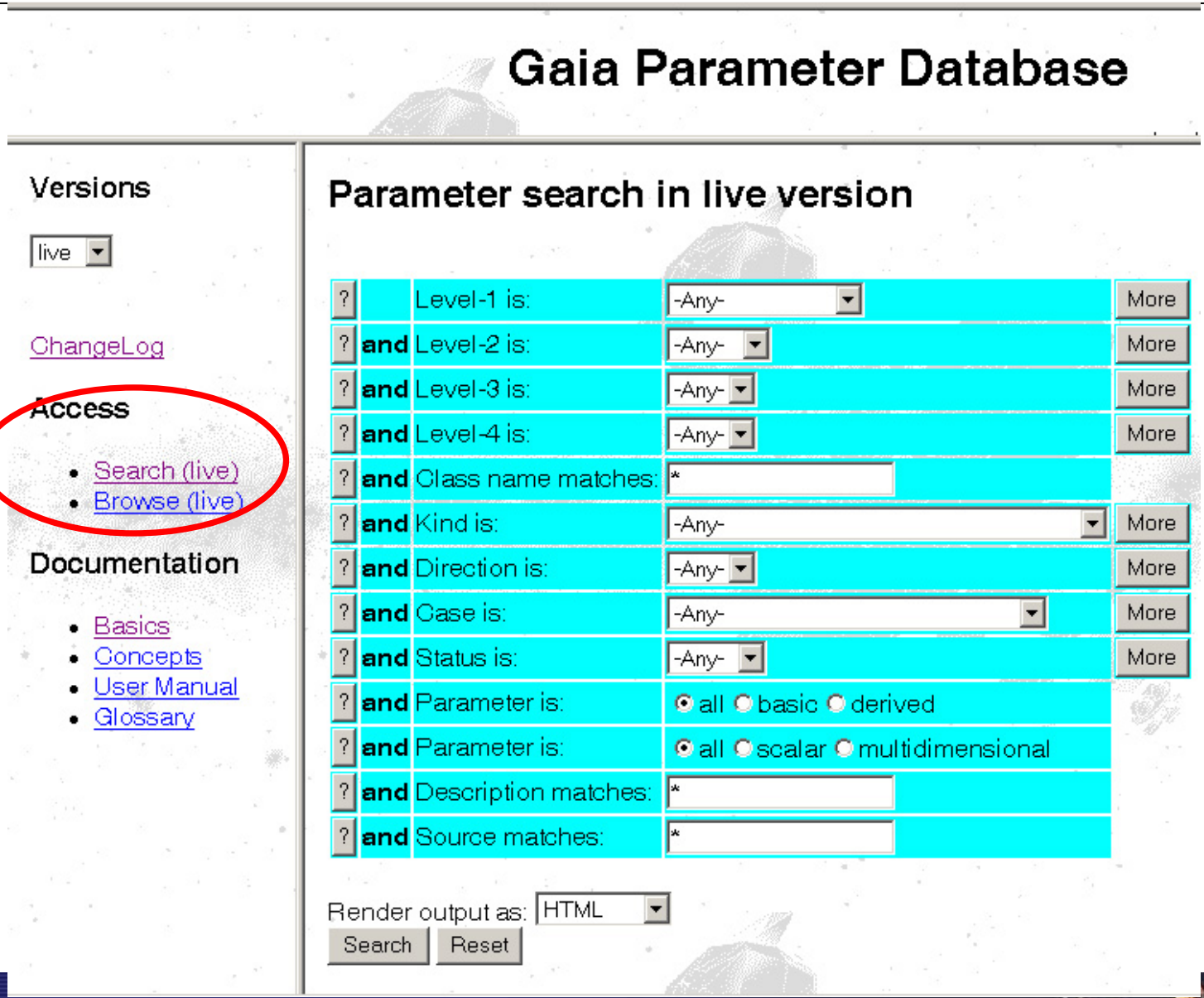
Download the data in FITS format

Plot the data for a quick view

Gaia Parameter Database: Plot of multi-dimensional data

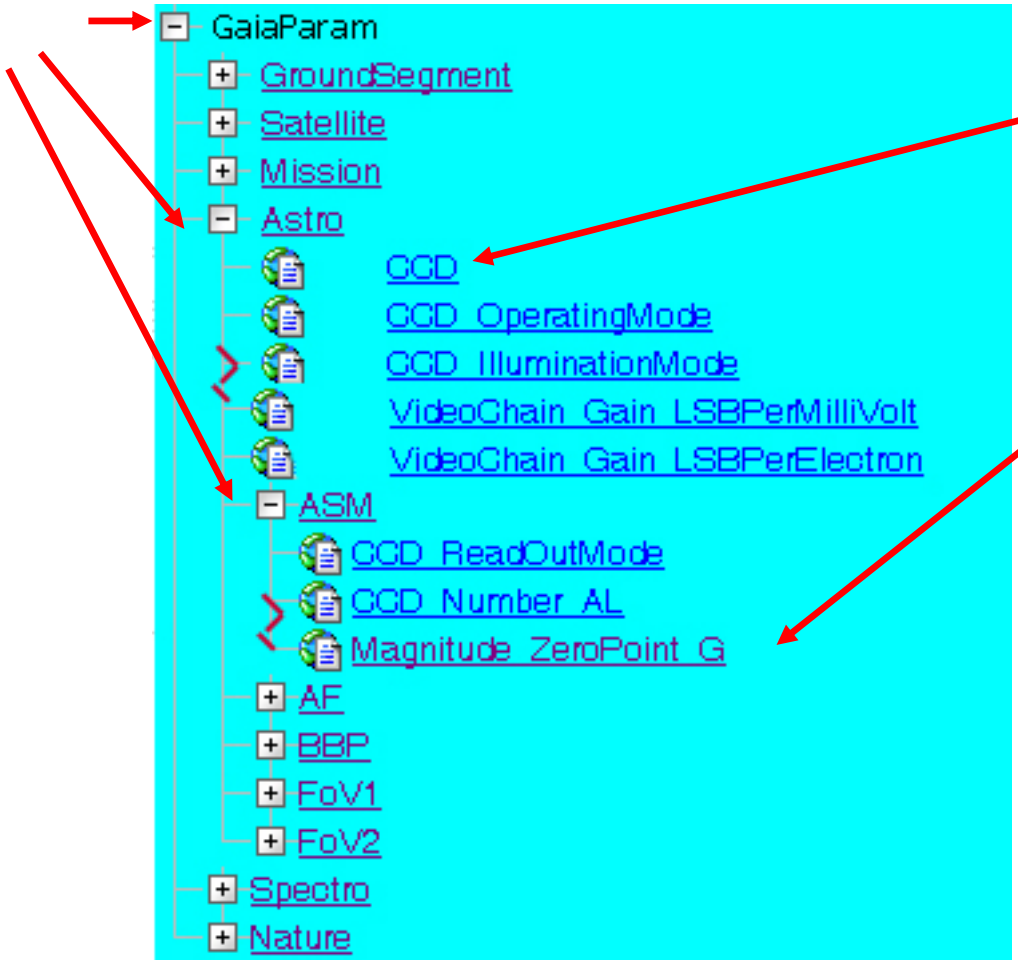


Gaia Parameter Database: www interface



Gaia Parameter Database: Access/Browse

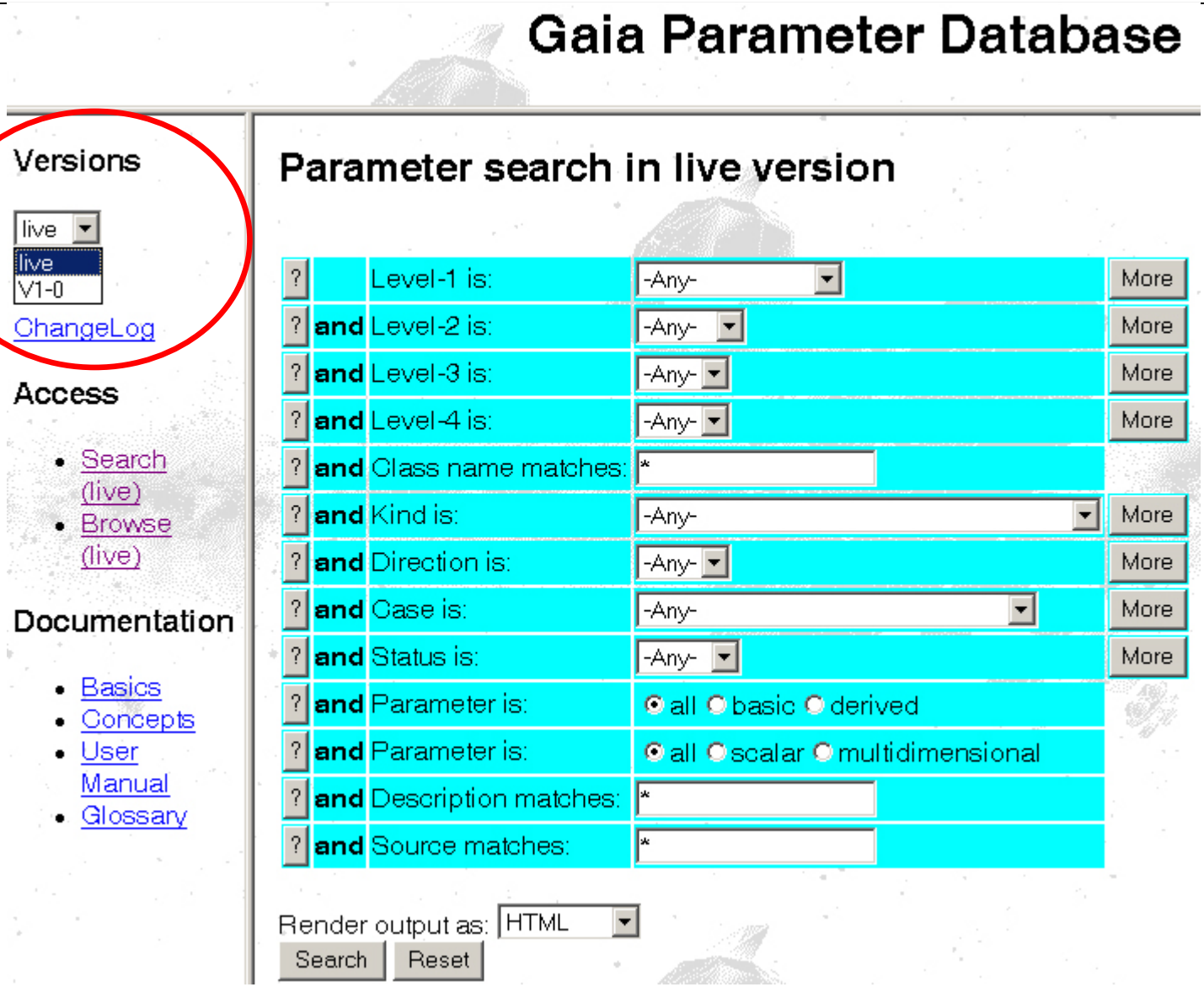
Expandable nodes provide access through parameter hierarchy



Click on parameter name to access full info – data returned as for search

Browse the parameter database

Gaia Parameter Database: Versions



Gaia Parameter Database: Versions

- "Live" gives the latest value of all parameters – suitable for interactive use.
- For software applications use a controlled release of the database (currently V1-0).
- New versions released infrequently ~ 2/3 per year.

Gaia Parameter Database: Documents

- The Gaia Parameter Database – Technical users manual

  [Author: U. Lammers; Livelink (GAIA-UL-001)]

- A proposal for a Gaia parameter database

  [Authors: J. de Bruijne, U. Lammers, M.A.C. Perryman; Livelink (GAIA-JDB-007)]

These documents are also available directly from the parameter database web pages.

Gaia Parameter Database: Feedback

- Feedback on content and use is welcomed
- Proposals for new parameters welcomed
- Questions about the database should be directed to:

gaialib@rssd.esa.int

www.rssd.esa.int/gaia

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esa Gaia European Space Agency

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Restricted Access

Welcome to ESA's web site for the Gaia scientific community. For more about this and other Gaia web sites follow the 'More about Gaia' link.

News from Gaia

2004-03-31 **Final presentation of the RVS instrument study**
The first phase of the RVS instrument design has come to an end with the final presentation of the work performed to date by the RVS Consortium. This scientific consortium comprising Mullard Space Science Laboratory, Observatoire de Paris-Meudon, Brunel University, University of Leicester, Osservatorio di Asiago, and University of Ljubljana, and led by Professor Mark Cropper (MSSL), worked with ESA and the industrial System Level Technical Assistance contractors under the direction of ESA Study Manager Oscar Pace. The consortium has refined all aspects of the instrument design (optics, detector, mechanical, thermal, and on-board processing) providing a baseline design for Gaia's radial velocity spectrograph. This will be refined further during the Definition Study phase, extending to mid-2005.

2004-03-03 **Gaia proceeds to Phase B1**
On 2-3 March, separate presentations were made by Alcatel/Alenia and EADS-Astrium to ESA representatives (from the Gaia project and outside) and the Gaia Science Team. Extensive presentations summarised the activities which have been carried out under the parallel System Level Technical Assistance Contracts which have been running with these industrial teams for the past two years. As a result, authorisation has been given for Gaia to enter Phase B1, the detailed definition phase, which is expected to start in April 2004, and which will extend for 1 year. Gaia therefore continues to remain on schedule for a launch in 2010.

2004-02-23 **Gaia in 2003 - status report now available**

Gaia Symposium: The Three Dimensional Universe with Gaia

Registration for the Symposium is now open

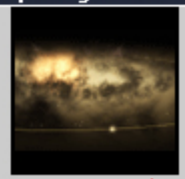
Picture of the week

The Gaia supercomputer

Gaia people

Adriaan Blaauw

Spotlight on ...



Geneva-Copenhagen survey of the Solar neighbourhood