

Gaia DR2/3: Serving Time Series, Spectra, SSOs in the VO

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Issue/Revision: 1.0

Reference: Gaia Archive – VO inside

Status: Issued

ESA UNCLASSIFIED - Releasable to the Public



gaia

European Space Agency

- Homogeneity through common Data Models
 - Mission DMs in line with VO DMs
- Interoperability through Open Protocols
 - VO protocols as core of archive architectures
 - Extend instead of replace
- Goal: Transparent access to Archives and Data providers worldwide



Data Release Scenario

MDB Data Volumes



Main Database Statistics

	Volume today	Estimation 5-year ext.
Size (as of today)	225 TB	~1.4 PB
Number of objects (sources, transits...)	1300 billion	~6000 billion

Total DR1: 1.6 TB

Gaia

• Gaia DR1 catalogue	1.1x10 ⁹	rows
• TGAS	2.0x10 ⁶	rows

External Catalogues

• Hipparcos & Hipparcos new red.	1.2x10 ⁶	rows
• IGSL (Initial Gaia Source List)	1.2x10 ⁹	rows
• 2MASS	4.7x10 ⁸	rows
• Tycho2	2.5x10 ⁶	rows
• UCAC4	1.1x10 ⁸	rows
• Hubble Source Catalogue v1.0	2.9x10 ⁷	rows

Crossmatches

• Crossmatch tables between Hipparcos, 2MASS, Tycho2... and Gaia expressed as neighbourhood and best neighbour, e.g:		
• AllWise-Gaia neighbourhood	3.1x10 ⁸	rows

11.59 Billion rows through TAP+

- DR2 contents (April 2018)
 - Main Catalogue
 - Astrometric 5 parameter solution for “all” stars
 - G magnitude for “all” stars
 - RV for bright sources ($G_{\text{rvs}} < 12$)
 - Astrophysical parameters for bright sources ($G < 17$)
 - BP/RP integrated photometry
 - Variables: All sky RR Lyrae stars, Cepheids, LPVs, Short-Time scale, Classification all types, (and EB for CU4, not DR2)
 - Xmatches with “main” catalogues
 - **SSOs**
 - Detections for MPC objects
 - **Epoch Photometry**
 - ~ 100 million sources

Archive content @ DR3

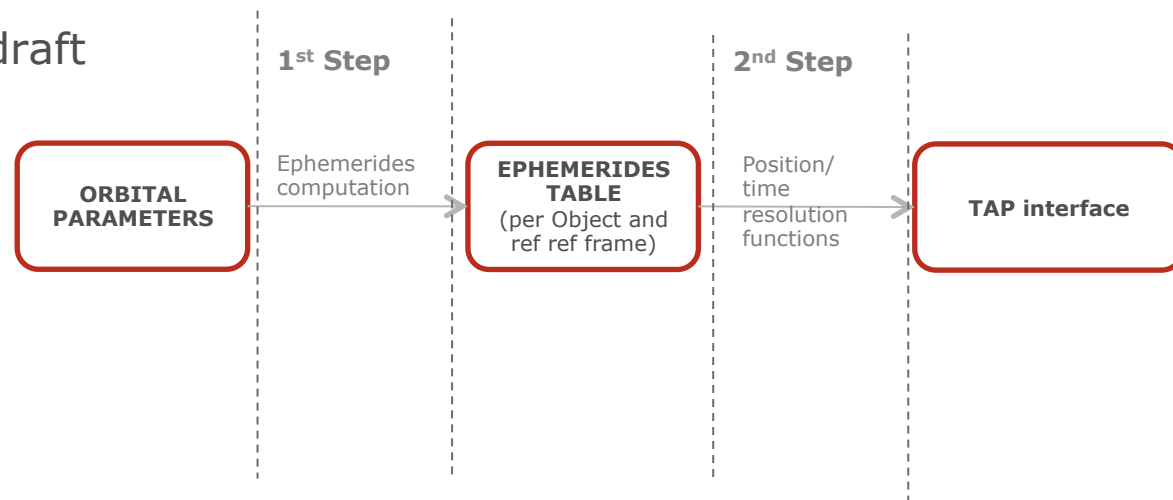


- DR3 contents (TBD ~2020?)
 - Main Catalogue
 - **Spectra**
 - RVS (Averaged, Epoch)
 - BP/RP (Averaged, Epoch) ($\sim 1E9$, ~ 70 obs)
 - Epoch Photometry ($\sim \mathbf{1E9}$)
 - SSOs

SSOs

- TAP service adaptation for SSO handling
 - UDFs definition for SSOs
 - Based upon IMCCE Eproc integration performed for ESASKy SSO search service
 - Possible ADQL extension with datatypes and functions to EPN-TAP?

- SSO Data Model
 - EPNCore V2 draft



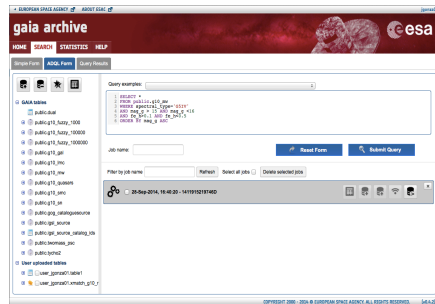
Time Series and Spectra

VO Inside Time Series & Spectra



- DAL side
 - Extension of DataLink through Custom Access Data Service
 - No protocol extension needed
 - Archive data distribution has Mission specific features
 - DataLink recognition
 - On the fly data serialization to requested formats
 - SSAP, Obscore TS vs SVO TS-SSAP?

DataLink/SSAP int. with TAP+

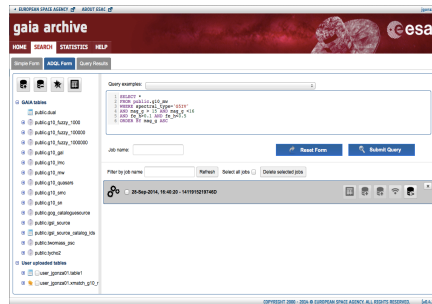


TAP+



Catalogues

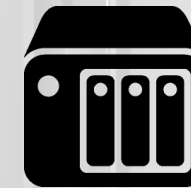
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TAP+

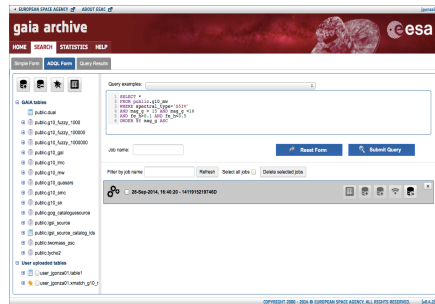


Catalogues



Time Series Spectra

DataLink/SSAP int. with TAP+



TAP+

DataLink

* DR2

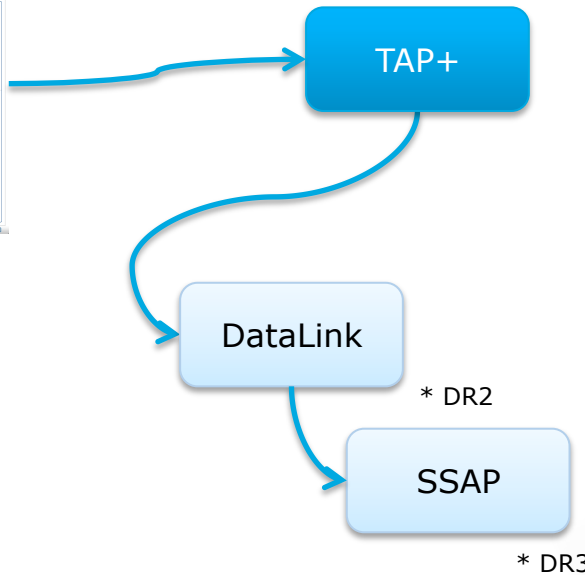
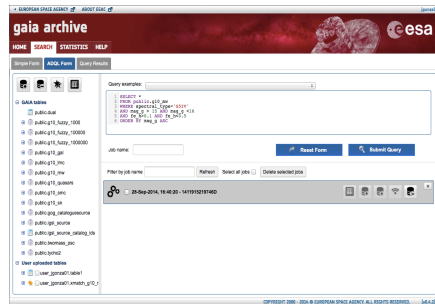


Catalogues



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- Applications
 - Spectra (VOSpec, SPLAT-VO)
 - Time Series (A. Nebot talk on SCI session)

DR2 Contents



Thanks!