





# ConeSearch revision & extension for Time filtering

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# Time in ConeSearch: why?

The need from multi-messenger time domain astronomy.

A short story...

Time Domain astronomer

Have there been observations between these two dates?

ConeSearch service

I don't know when, but I can tell you where...

Not enough!



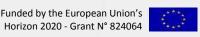




### **Possible Solutions**

- Solution 1
  - ST-MOC to define the space and time coverage
    - OK, it works, but it is a bit complicated to use, plus it requires two step approach to get the data (create the STMOC, filter table by STMOC)
- Solution 2
  - Extend ConeSearch to add a time search
    - Advantages: one step approach (query data by interval of time)





# ConeSearch revision solution

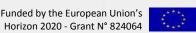
#### 1 new optional parameter: TIME

- the time interval to be searched for data
  - open or closed interval with numeric values
- interpreted as MJDs
  - values interpreted as UTC time scale and UNKNOWN reference position
    - as specified in DALI in the section on literal values
  - MJD values always in days
- constraint is satisfied if the interval intersects the time coverage of the observation

## (VOTable) response addition

- exactly one FIELD, representing the time of the observation, MUST
  - have ucd="time.epoch;meta.main"
  - have datatype set to "float" or "double" ISO? [char]



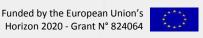




# **But ConeSearch needs some revision itself...**

Simple Cone Search Version 1.03

IVOA Recommendation 22 February 2008







# An attempt some time ago...

- Revision started in 2017 tried to
  - Keep up with DALI & VOSI specifications
  - Error Response
  - Resource Registration
  - RA & Dec datatype response
  - MAXREC & RESPONSEFORMAT (keeping SR=0)
  - Fix VOTable response version
  - Metadata discovery solution
  - HTTP methods update
- while moving source to latex
  - included quite some refactoring
  - and left some decisions pending...







#### **Leftovers...**

- Minor/Major revision discussion
- RESOURCE type & number
- ReST vs. query-param I/F
- UCD updates
- EPOCH query param
- Inclusion of ConeSearch-1.03-Erratum1

Major revision automatically cleans most of the above and most deprecated parts of current text. [MMo] was leaning positively towards a major revision but ... yesterday a hack-a-thon happened...







#### Revision issues roughly work in blocks

- General
  - Erratum, RESOURCE flexibility, ReST-like I/F, UCD1+ update, EPOCH param, discovery of optional parameters
- Time related
  - VOTable response 1.4+ (TIMESYS), TIME parameter, solution for allsky (i.e. ignore position), ST/MOC filtering
- Common
  - Resource registration, ConeSearch+Time service filtering
- ... other may arise, but we'll keep "simple" in mind.







#### We will work them out

- Also through GitHub hurdles
- Pushing for server and client take up

still ... we need to identify the proper way to decide whether it would be

- ConeSearch-1.1
- ConeSearch-2.0

(stay tuned for hack-a-thon summary on major revision hurdles...)

However...







# Let's keep it SIMPLE!

Thank you for your attention...
...we're open for discussion!



