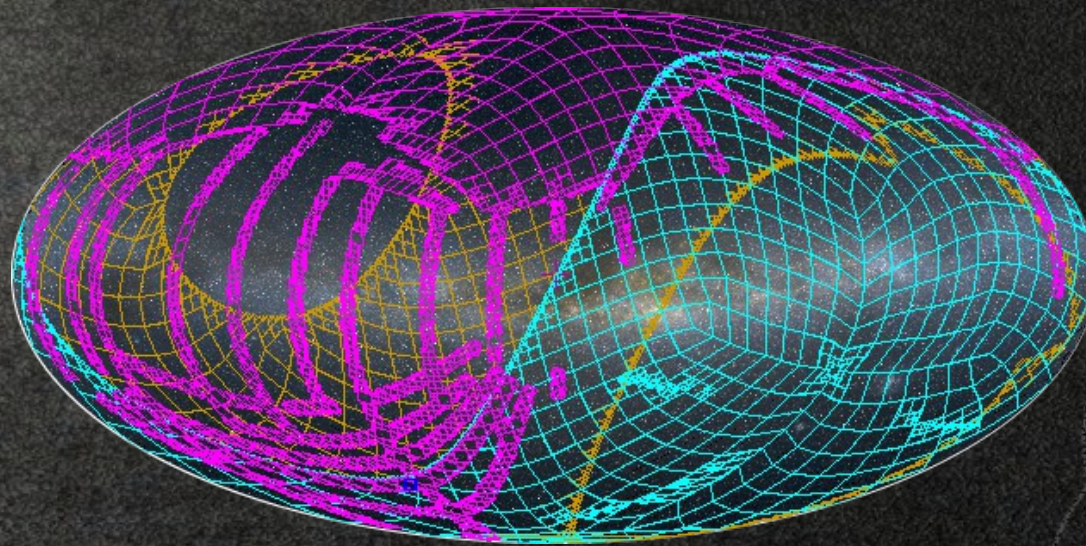



MOC state-of-the art

Pierre Fernique [CDS]



IVOA Interop – Sept 2013 - Hawaii

MOC Working draft



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Alliance*

MOC – HEALPix Multi-Order Coverage map
Version 1.0
IVOA Working Draft 14 Mar 2013

This version:
1.0: Working Draft 2013-03-14

Previous version(s):
None

Interest/Working Group:
Applications: <http://www.ivoa.net/wiki/bin/view/IVOA/IvoaApplications>


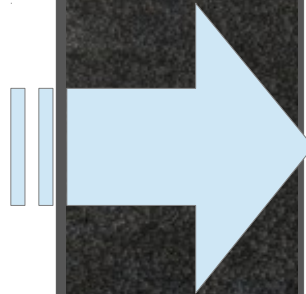
Editor:
Pierre Fernique

Authors:
Thomas Boch, Tom Donaldson, Pierre Fernique, Wil O'Mullane,
Martin Reinecke, Mark Taylor

Abstract

This document describes the Multi-Order Coverage map method (MOC) to specify sky regions. The goal is to have a way for providing very fast comparisons and data access methods. The principle is based on HEALPix sky tessellation. It boils down to defining a list of sky cells, grouped hierarchically.

Status of This Document



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MOC – HEALPix Multi-Order Coverage map
Version 1.0
IVOA Working Draft 10 Sep 2013

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Previous version(s):
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Interest/Working Group:
Applications: <http://www.ivoa.net/wiki/bin/view/IVOA/IvoaApplications>

Editor:
Pierre Fernique

Authors:
Thomas Boch, Tom Donaldson, Daniel Durand, Pierre Fernique, Wil O'Mullane,
Martin Reinecke, Mark Taylor

Abstract

This document describes the Multi-Order Coverage map method (MOC) to specify arbitrary sky regions. The goal is to be able to provide a very fast comparison mechanism between coverage maps. The mechanism is based on

New WD release

- Implements Heidelberg conclusions
- Goal : describe the data origin used to build the MOC
- Solution : FITS keywords
- Very minor update – realized during the summer
- New release → 10 Sept 2013
- *Thank for contributors*

Example of FITS header for a MOC

■ Mandatory

■ Optional

```
SIMPLE = T
BITPIX = 8
NAXIS = 0
EXTEND = T
END

XTENSION= 'BINTABLE' / HEALPix Multi Order Coverage map
BITPIX = 8
NAXIS = 2
NAXIS1 = 4
NAXIS2 = 16461
PCOUNT = 0
GCOUNT = 1
TFIELDS = 1
TFORM1 = '1J '
TTYPE1 = 'NPIX ' / HEALPix UNIQ pixel number
PIXTYPE = 'HEALPIX ' / HEALPix magic code
ORDERING= 'NUNIQ ' / NUNIQ coding method
COORDSYS= 'C ' / ICRS reference frame
MOCORDER= 12 / MOC resolution (best order)
MOCTOOL = 'Aladin7.5 ' / Name of the MOC generator
MOCTYPE = 'CATALOG' / Source type (IMAGE or CATALOG)
MOCID = 'ivo://CDS/I/259' / Identifier of the collection
ORIGIN = 'ivo://CDS' / MOC origin
DATE = '2013-06-15T11:50:43' / MOC creation date
EXTNAME = 'Tycho MOC' / MOC name
END
```

Roadmap

- Feb 2013: first WD (internal)
- Mar 2013: Revised WD: MOC-1.0-WD-20130314
- May 2013: Discussed at Heidelberg Interop in joint Apps/Registry session
- Sep 2013: Revised WD: MOC-1.0-WD-20130910
- **Sep 2013: Discuss implementation experience at Hawaii Interop**
- Fall 2013: PR?
- Early 2014: REC?

MOC tool & lib

- Creation from **catalogs** => STILTs

```
stilts pixfoot in=survey.vot ra=RA2000 dec=DEC2000  
order=8 out=sfoot.fits
```

- Creation from **image collections** => Aladin

```
aladin -mocgen in=DirScuba order=15 out=sfoo.fits
```

- Operations : STILTs, Aladin

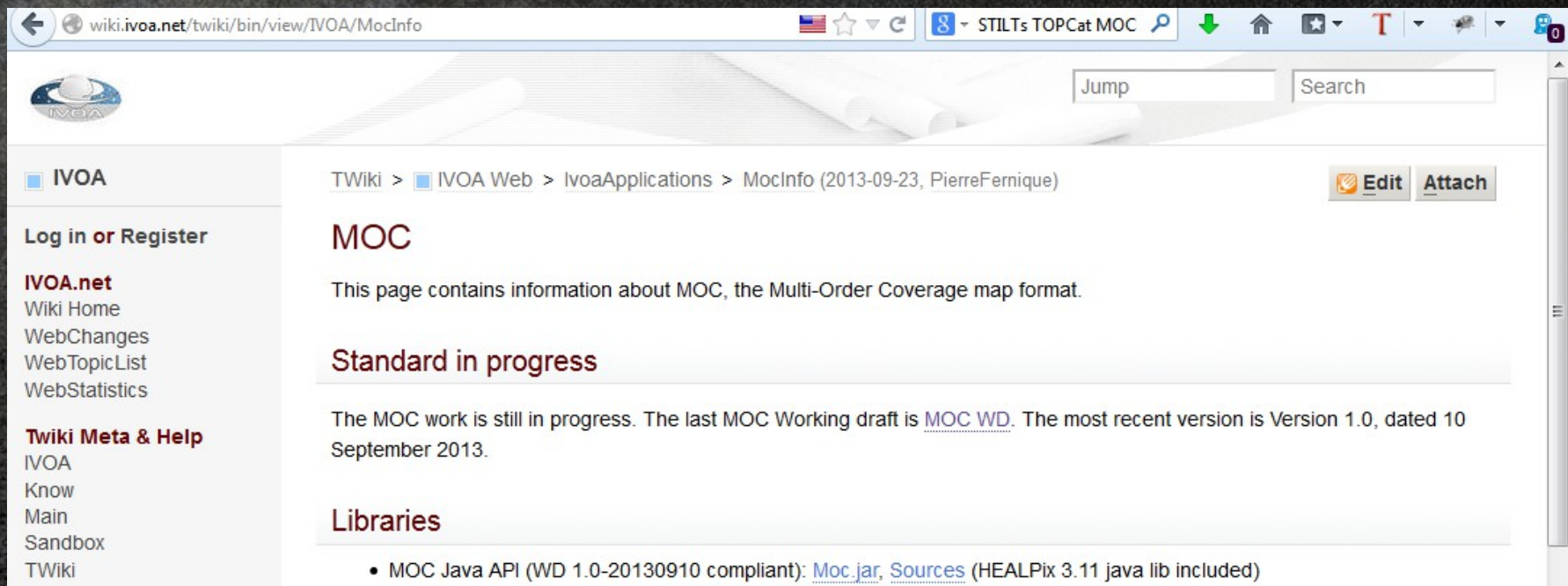
- Library : Java API => Moc.jar (WD 1.0 20130910 compliant)

```
moc.setProperty("ORIGIN", "ivo://GAVO");
```

Link

- On IVOA Application Wiki :

=> <http://wiki.ivoa.net/twiki/bin/view/IVOA/MocInfo>



The screenshot shows a web browser window displaying the IVOA Application Wiki page for MOC. The browser's address bar shows the URL wiki.ivoa.net/twiki/bin/view/IVOA/MocInfo. The page features a navigation menu on the left with links for IVOA, Log in or Register, IVOA.net (Wiki Home, WebChanges, WebTopicList, WebStatistics), Twiki Meta & Help (IVOA, Know, Main, Sandbox, TWiki), and a search bar at the top right. The main content area includes a breadcrumb trail (TWiki > IVOA Web > IvoaApplications > MocInfo), a title section for MOC, a description of MOC as a Multi-Order Coverage map format, a section for the Standard in progress, and a Libraries section listing a MOC Java API.

wiki.ivoa.net/twiki/bin/view/IVOA/MocInfo

STILTs TOPCat MOC

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TWiki > IVOA Web > IvoaApplications > MocInfo (2013-09-23, PierreFernique) [Edit](#) [Attach](#)

MOC

This page contains information about MOC, the Multi-Order Coverage map format.

Standard in progress

The MOC work is still in progress. The last MOC Working draft is [MOC WD](#). The most recent version is Version 1.0, dated 10 September 2013.

Libraries

- MOC Java API (WD 1.0-20130910 compliant): [Moc.jar](#), [Sources](#) (HEALPix 3.11 java lib included)

And now...

- MOC repositories

- Presently : CDS + CADAC + ROE (12 310 data set MOCs)
- VO registries ? Link ? Incorporation ?
- Which data set level ?
by tables or catalogs, filters or missions, both ?
- Source positional errors included ?
- Which MOC order ?
accuracy vs size (MocOrder 8 (13.7') => 100MB for all Vizier MOCs)
- Which protocols ?
query : by position, by STC, by MOC... response : list of datasets, MOC...

- Other needs

- Method enlarge() : enlarge a MOC (constant error of source position)
- Conversion STC <=> MOC ?
- MOC compression ?

Question ?
Comments ?
Contributions ?

