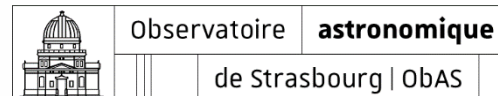


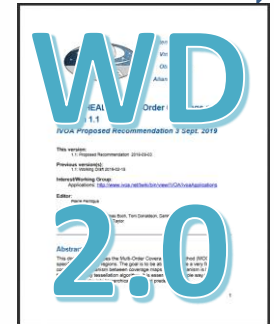
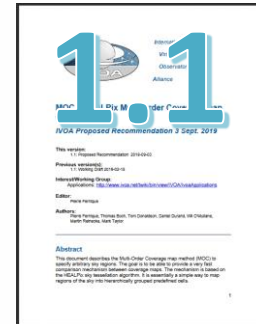
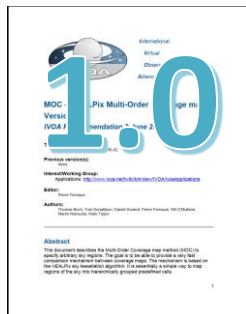
MOC 2.0 Validator

Spring Interop (virtual) – 25-28 May 2021

Pierre Fernique
with all other MOC authors and contributors



□ MOC standard time line



Space Moc (Healpix)
FITS serialization

...+
ASCII serialization

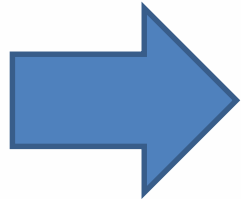
...+
Time MOC
Space.Time MOC



□ Requirements for REC

- 1 document ready for RFC
- 1 validator
- 2 independant reference implementations

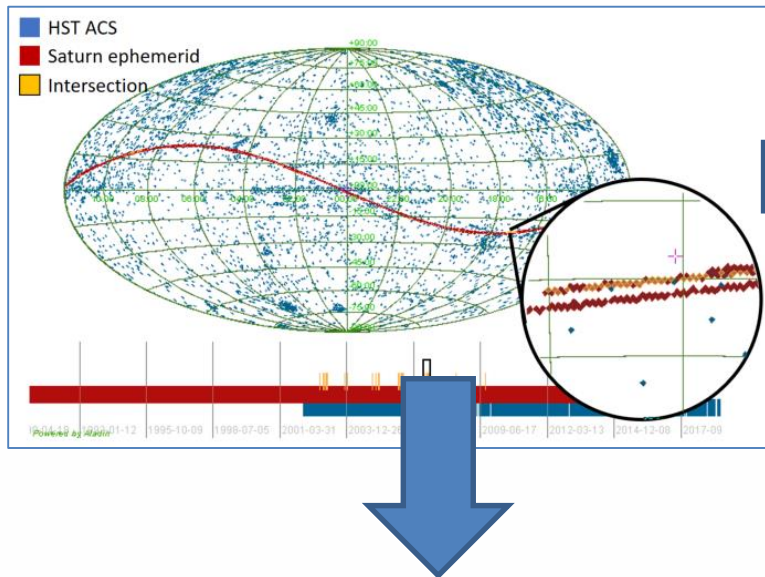
□ Requirements for REC

- 
- ✓ 1 document ready for RFC
 - **1 validator**
 - ✓ 2 independant reference implementations
 - ✓ - Java Moc
 - ✓ - MOCPy

Validator role

=> *Is my MOC IVOA compliant ?*

1. FITS serialization



Example of FITS headers for a MOC:

```
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 = 'UNIQ ' / HEALPix UNIQ pixel number
ORDERING = 'NUNIQ ' / NUNIQ coding method
COORDSYS = 'C' / ICRS reference frame
MOCDIM = 'SPACE' / Physical dimension
MOCORD_S = 12 / MOC resolution (best order)
MOCSTOOL = 'Aladin1.1 ' / Name of the MOC generator
MOCSTYPE = 'CATALOG' / Source type (IMAGE or CATALOG)
MOCID = 'ivo://CDS/1/259' / Identifier of the collection
MOCVERS = '2.0' / MOC standard version
ORIGIN = 'ivo://CDS' / MOC origin
DATE = '2013-06-15T11:50:43' / MOC creation date
EXTNAME = 'Tycho MOC' / MOC name
END
```

Valid ?

2. ASCII serialization

EBNF definition of an ASCII MOC:

```
moc ::= ordpix (sep+ ordpix)*
ordpix ::= int '/' sep* pixs
pixs ::= pix (sep+ pix)*
pix ::= int? | (int '-' int)
sep ::= [ \n\r]
int ::= [0-9]+
```

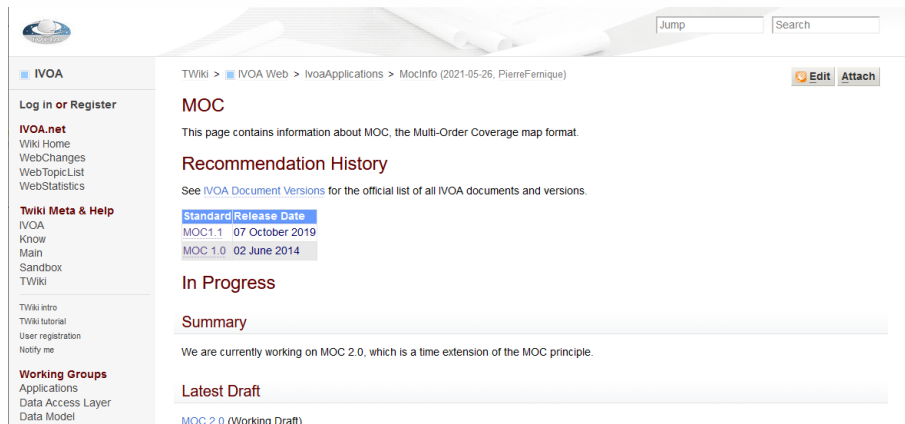
Valid ?

CDS MOC Validator

Upgraded to be MOC 2.0 compliant (last WD)

- MocInfo page on IVOA site

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

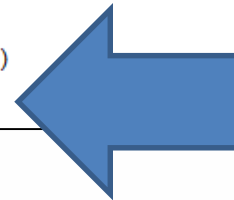


The screenshot shows the IVOA MOC page on the TWiki site. The page title is "MOC" and it contains information about the Multi-Order Coverage map format. The page includes a "Recommendation History" section with a table of releases, an "In Progress" section, a "Summary" section, and a "Latest Draft" section. The "Latest Draft" section is currently empty.

Standard Release Date
MOC1.1 07 October 2019
MOC 1.0 02 June 2014

Lib, tools & data associated to MOC 2.0 effort (time extension - in progress)

- MOCJava API (WD 2.0 compliant): [JavaMoc2_0.jar](#), [Sources](#) (beta)
- Aladin Desktop (version > 11.055) : [Aladin Desktop beta](#)
- STMOC Fits example: [STMOC.fits](#) (XMM STMOC - 10000 Obscure first observations)
- MOC validator : [MocLint.jar](#) (ex: `java -jar MocLint.jar STMOC.fits`)



□ Characteristics

- Validator 3 in 1:
 - **1.0** REC
 - **1.1** REC
 - **2.0** WD
- Checks all existing MOC serializations:
 - **FITS**
 - **ASCII**
 - *(and also **JSON** => not IVOA standard)*

□ One code, Two usages

- **Locally:**
=> java command with MocLint.jar
- **Remotely:**
=> MocServer facility (via HTTP post)
- **Same code:** cds.moc.misc.MocLint
=> part of cds.moc lib (misc package)
=> but not based on same methods as far as possible (written independently)

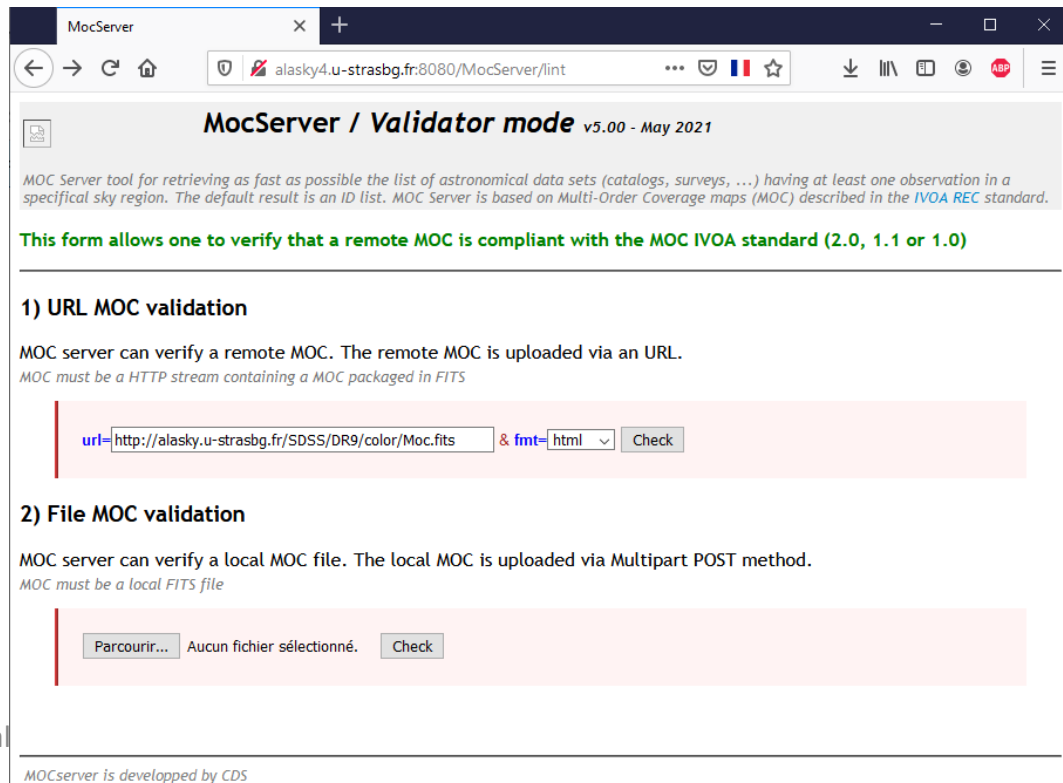
□ Local usage

```
% java -jar MocLint.jar MyOldStmoc.fits
```

```
INFO      Fits MOC serialization
INFO      Generated by: MOCpy
INFO      Number of rows: 1864058
INFO      Coding: 64 bits long
INFO      Moc version: <2.0
INFO      Moc order: 16
WARNING [0]: ORDERING=RANGE29 is a prototype of STMOC => not standard
INFO      FITS size: 14918400 bytes
STATUS   WARNING! MOC proto 2 ok but not compliant with IVOA final recommendation
```

□ Remote usage

- Test (temporary) site:
<http://alasky4.u-strasbg.fr:8080/MocServer/lint>



The screenshot shows a web browser window titled "MocServer" with the address bar displaying "alasky4.u-strasbg.fr:8080/MocServer/lint". The page content includes the title "MocServer / Validator mode v5.00 - May 2021" and a description of the tool. A green notice states: "This form allows one to verify that a remote MOC is compliant with the MOC IVOA standard (2.0, 1.1 or 1.0)".

1) URL MOC validation

MOC server can verify a remote MOC. The remote MOC is uploaded via an URL.
MOC must be a HTTP stream containing a MOC packaged in FITS

url= & fmt=

2) File MOC validation

MOC server can verify a local MOC file. The local MOC is uploaded via Multipart POST method.
MOC must be a local FITS file

Aucun fichier sélectionné.

MOCserver is developped by CDS

□ Remote usage

- Test (temporary) site:
<http://alasky4.u-strasbg.fr:8080/MocServer/lint>

MocServer / Validator mode v5.00 - May 2021

MOC Server tool for retrieving as fast as possible the list of astronomical data sets (catalogs, surveys, ...) having at least one observation in a specific sky region. The default result is an ID list. MOC Server is based on Multi-Order Coverage maps (MOC) described in the IVOA REC standard.

This form allows one to verify that a remote MOC is compliant with the MOC IVOA standard (2.0, 1.1 or 1.0)

1) URL MOC validation

MOC server can verify a remote MOC. The remote MOC is uploaded via an URL.
MOC must be a HTTP stream containing a MOC packaged in FITS

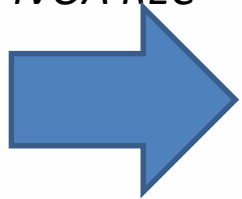
url= & fmt=

MOC must be a local FITS file

Aucun fichier sélectionné.

MOCserver is developed by CDS

Will be transferred to the CDS public MocServer site as soon as MOC 2.0 is an IVOA REC



<http://alasky.u-strasbg.fr/MocServer/lint>

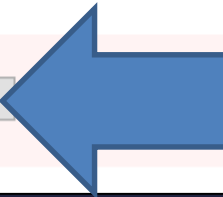
2) File MOC validation

MOC server can verify a local MOC file. The local MOC is uploaded via Multipart POST method.

MOC must be a local FITS file

Parcourir... STMOC.fits

Check



MocServer / Validator mode v5.00 - May 2021

MOC Server tool for retrieving as fast as possible the list of astronomical data sets (catalogs, surveys, ...) having at least one observation in a specific sky region. The default result is an ID list. MOC Server is based on Multi-Order Coverage maps (MOC) described in the [IVOA REC](#) standard.

This form allows one to verify that a remote MOC is compliant with the MOC IVOA standard (2.0, 1.1 or 1.0)

Come back to the [Lint](#) form

```
INFO      Fits MOC serialization
INFO      Generated by: CDSjavaAPI-6.1
INFO      Number of rows: 1254646
INFO      Coding: 64 bits long
INFO      Moc version: 2.0
INFO      Moc dimension: TIME.SPACE
INFO      Space order: 12
INFO      Time order: 31
INFO      FITS size: 10045440 bytes
STATUS  OK! MOC compliant with IVOA MOC 2.0 recommendation
```

MOCserver is developed by CDS



1 Validator

<http://alasky4.u-strasbg.fr:8080/MocServer/lint>

2 examples for your tests

<http://aladin.u-strasbg.fr/JavaMoc6beta/STMOC.fits>

<http://aladin.u-strasbg.fr/JavaMoc6beta/STMOCERROR.fits>

Feel free to test it !

Question ?