

# 2020 Joint LACE Data Assimilation DasKIT Working Days – OBSMON exercise

## Build and run the OBSMON tool with gmkpack

**Author :** Idir DEHMOUS

Royal Meteorological Institut (Belgium)

**E-mail :** idehmous@meteo.be

The exercise could be found on beaufix machine under the path /home/gmap/mrpm/dehmousi/DAsKIT2020

### **Note :**

It's recommended to follow the same directories architecture to make the installation as easy as possible !

The directory DAsKIT2020 contains the following sub-directories and files :

### **obsmon**

Contains a slurm job « run\_obsmon.sh » to run the OBSMON binary and a bash script «merge\_sqlite.sh» in order to merge the output files given by the OBSMON binary

### **sqlite3**

Contains the sqlite3 source code and « flibs » ( the Fortran sqlite interface). The sqlite3 version 3.33 is used in this exercise , it could be downloaded using the following link

<https://www.sqlite.org/2020/sqlite-autoconf-3330000.tar.gz>

### **obsmon-src**

Contains the obsmon Fortran source code and its modules.

### **obsmon\_link.tar**

Tarball file containing the necessary directories to use in order to link obsmon with gmkpack as an external binary.

### **README**

A file which explains the steps to follow to build and run OBSMON tool.

## I. Install sqlite3 C and Fortran library (Thanks to Lesley de Cruz for the Makefile )

- In order to install sqlite3 just run the commands below cd

```
$HOME/DAsKIT2020/sqlite3
```

```
tar -xvf sqlite-autoconf-3330000.tar.gz
```

```
make
```

The Makefile builds and installs the both C and Fortran sqlite libraries **libfsqlite.a** and **libsqlite3.a** under the path `$HOME/DAsKIT2020/sqlite3/lib`

## II. Build the OBSMON binary with gmkpack

- Make OBSMON to be recognized by gmkpack as an external binary

```
mkdir -p $HOME/.gmkpack/link/obsmon
```

```
cp $HOME/DAsKIT2020/obsmon_link.tar $HOME/.gmkpack/link/obsmon/.
```

```
cd $HOME/.gmkpack/link/obsmon
```

```
tar -xvf obsmon_link.tar
```

The tar file contains the files below

### **blacklist entry excluded\_libs ldflags name projlist system\_libs**

- Create a new pack using the following gmkpack command  
`gmkpack -f /home/mf/dp/marp/martinezs/packs -r 43t2 -b bf -v 10 -u obsmon -l IMPI512IFC1601 -o 2y -g cy -e .pack -p obsmon`

- Populate the new pack with the obsmon source code and modules  
`cp $HOME/DAsKIT2020/obsmon-src/bin/obsmon.f90 ~/src/local/odb/tools/.`  
`cp $HOME/DAsKIT2020/obsmon-src/modules/*.f90`  
`~/src/local/odb/module/.`

- Add the sqlite3 library paths to the « ics\_obmon » script

**For background libraries :**

`$HOME/DAsKIT2020/sqlite3/lib/libsqlite3.a`

`$HOME/DAsKIT2020/sqlite3/lib/libfsqLite.a`

**For the Low-level libraries :**

`-L$HOME/DAsKIT2020/sqlite3/lib -lsqLite3`

`-L$HOME/DAsKIT2020/sqlite3/lib -lfsqLite`

- Add the sqlite3 and flibs include path to the gmkfile

```
vim YourPack/.gmkfile/IMPI512IFC1601.BFX
```

```
INCLUDEPATH=path1:path2..:$HOME/DAsKIT2020/sqlite3/flibs:
```

```
$HOME/DAsKIT2020/sqlite3/include
```

Save the modifications and Run the « ics\_obsmon » script

```
sbatch ics_obsmon
```

### **III. Run the OBSMON binary**

```
cd $HOME/DAsKIT2020/obsmon
```

```
sbatch run_obsmon.sh
```

Samples of ODB are provided in the directory

```
$HOME/DAsKIT2020/obsmon/odb
```

Once the job is finished, the output files are written in the directory `$HOME/DAsKIT2020/obsmon/out`

### **Remarks**

- The ODB(s) to be used in OBSMON processor tool must be the ones which have more statistics, in other words , the ones updated by either Canari (conf e701) , screening (conf e002 ) or minimisation (conf e131) and not the ones written directly by BATOR.
- This exercise is done using the cy43t2 odb files , however if there is no changes in the odb software of the IFS/ARPEGE code , the OBSMON should be able to handle the future versions of ODB(s).

- The output sqlite files couldn't be used directly on the Obsmon shiny interface. A bash script «merge\_sqlite.sh » is provided in order to merge and rename the output files and could be run as follow  
./merge\_sqlite.sh

The finale sqlite files are written for each run date under the directory \$HOME/DAsKIT2020/obsmon/db

#### **IV. Display the ODB on the obsmon shiny interface**

- Copy the directories under \$HOME/DAsKIT2020/obsmon/db to the machine where the obsmon shiny is installed as follow

```
mkdir -p /path/to/your/directory/ecma  
mkdir -p /path/to/your/directory/ecma_sfc
```

```
cp -rf $HOME/DAsKIT2020/obsmon/db/* /path/to/your/directory/ecma/.  
cp -rf $HOME/DAsKIT2020/obsmon/db/* /path/to/your/directory/ecma_sfc/.
```

Obsmon shiny interface expects to find the both directories ecma/ and ecma\_sfc/

- Configure your config.toml file  
[[experiments]]  
displayName = "Your experiment name"  
path = "/path/to/the/directory/containing/ecma and ecma\_sfc "