Manual de instalación y ejecución de un ejemplo de simulación cosmológica LCDM con Gadget2.

Mini-Taller-2017, Cinvestav.

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Las instrucciones de este manual fueron probados sobre el sistema Ubuntu Linux 16.

1. Preparar las carpetas

Requisitos:

openmpi-bin, openmpi-common, libopenmpi-dev, gcc

```
mkdir minitaller-2017
mkdir minitaller-2017/GSL
mkdir minitaller-2017/FFTW
mkdir minitaller-2017/run
```

Descargar todos los archivos en la carpeta

minitaller-2017

Descomprimir Gadget y N-Genic

```
tar xvfz gadget-2.0.7.tar.gz
tar xvfz n-genic.tar.gz
```

2. Compilar e instalar GSL

```
tar xvfz gsl-1.16.tar.gz
cd gsl-1.16
./configure  --prefix=/home/gabbasov/work/minitaller-2017/GSL
make
make install
```

3. Compilar e instalar FFTW

tar xvfz fftw-2.1.5.tar.gz
cd fftw-2.1.5
./configure --prefix=/home/gabbasov/work/minitaller-2017/FFTW --enable-mpi --enable-float --enable-type-prefix
make
make install
make clean
./configure --prefix=/home/gabbasov/work/minitaller-2017/FFTW --enable-mpi --enable-type-prefix
make
make install

4. Preparar la condición inicial

cd N-GenIC

editamos **Makefile**:

```
OPT  += -DPRODUCEGAS
SYSTYPE="OpenSuse"
```

lineas 47-50:

```
GSL_INCL =  -I/home/gabbasov/work/minitaller-2017/GSL/include
GSL_LIBS =  -L/home/gabbasov/work/minitaller-2017/GSL/lib
FFTW_INCL= -I/home/gabbasov/work/minitaller-2017/FFTW/include
FFTW_LIBS= -L/home/gabbasov/work/minitaller-2017/FFTW/lib
MPICHLIB =  -lmpi
```

comentar las lineas 218 y 219 en el archivo **save.c**

make

editar **ics.param**:

```
Nsample       64
OutputDir     ./
Box           50000.0
Tilefac       2
OmegaBaryon   0.04
Redshift      10
NumFilesWrittenInParallel    1
```

mpirun -np 4 ./N-GenIC ics.param

5. Compilar y correr Gadget

cd Gadget-2.0.7/Gadget2

editamos **Makefile**:

activar la linea 89 como plataforma:

SYSTYPE="Mako"

cambiamos las lineas 126-130:

GSL_INCL = -I/home/gabbasov/work/minitaller-2017/GSL/include
GSL_LIBS = -L/home/gabbasov/work/minitaller-2017/GSL/lib
FFTW_INCL= -I/home/gabbasov/work/minitaller-2017/FFTW/include
FFTW_LIBS= -L/home/gabbasov/work/minitaller-2017/FFTW/lib
MPICHLIB = -lmpi

make

cp Gadget2 /home/gabbasov/work/minitaller-2017/run
cp parameterfiles/lcdm_gas.param /home/gabbasov/work/minitaller-2017/run
cp parameterfiles/outputs_lcdm_gas.txt /home/gabbasov/work/minitaller-2017/run

editamos el **lcdm_gas.param**:

InitCondFile ics
OutputDir ./
OutputListFilename outputs_lcdm_gas.txt

echo “export LD_LIBRARY_PATH=/home/gabbasov/work/minitaller-2017/GSL/lib:$ LD_LIBRARY_PATH” > correr
echo “export LD_LIBRARY_PATH=/home/gabbasov/work/minitaller-2017/FFTW/lib:$ LD_LIBRARY_PATH” >> correr
echo "mpirun -np 4 ./Gadget2 lcdm_gas.param > salida.txt &" >> correr
chmod +x correr
./correr
tail salida.txt
tail info.txt

6. Visualización y detección de halos

requisitos:

libgtk2.0-0, libgtk2.0-dev, libcairo2, libcairo2-dev, gnudatalanguage

tar xvfz gadgetviewer-1.0.6.tar.gz

```
cd gadgetviewer-1.0.6
./configure
make
cp main/src/gadgetviewer ../run
cd ../run
./gadgetviewer snapshot_005

tar xvfz fof.tar.gz

cd FoF_Special
```

editamos **main.c** :

```
int GroupMinLen = 320;
```

```
make

cp FoF_Special  ../run
cp *.pro  ../run
cd ../run
./FoF_Special  ./  snapshot  5
```

editamos **ReadGroupParticleData.pro** :

```
Base= "./"  ;;;; path where stuff is stored
Num = 5   ;;;; number of dump
GrNr = 0   ;;; numer of group for which the particle data should be extracted
```

al final del archivo antes del ***end*** agregamos:

```
plot, PP[0,*], PP[1,*], psym=3, /ISOTROPIC
```

```
gdl
.run ReadGroupParticleData.pro
exit
```