

# How to install HARMONICS Linux (Ubuntu)

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**\*\* Verified version: harmonics 2.1.0 \*\***

## Verified environment

Windows 10 Home

VirtualBox version 5.2.12 r122591

## Verified OS on VirtualBox

Ubuntu16.04-LTS

## Setup

### 1. Install Ubuntu on VirtualBox

### 2. Install Qt

#### 2-1. Download

<https://www1.qt.io/download-open-source/#section-2>

Target file: qt-opensource-linux-x64-5.10.1.run

#### 2-2. Setup

Put qt-opensource-linux-x64-5.10.1.run on \$HOME/...

e.g.) \$HOME/tmp/setup/qt

#### 2-3. Install

Execute following commands via terminal on VirtualBox

```
$ cd $HOME/tmp/setup/qt
```

```
$ chmod +x qt-opensource-linux-x64-5.10.1.run
```

```
$ sudo ./qt-opensource-linux-x64-5.10.1.run
```

#### 2-4. Install Direction

/opt/Qt5.10.1

### 3. Install required packages

```
$ sudo apt-get install libglib2.0-dev libSM-dev libxrender-dev libfontconfig1-dev  
libxext-dev
```

```
$ sudo apt-get install build-essential
```

```
$ sudo apt-get install libfontconfig1
```

```
$ sudo apt-get install mesa-common-dev
```

```
$ sudo apt-get install libglu1-mesa-dev
```

If you cannot find installation files, select package-installation.

```
/usr/include/GL/glut.h
```

```
$ sudo apt-get install freeglut3-dev
```

```
/usr/include/opencv/highgui.h
```

```
$ sudo apt-get install libhighgui-dev
```

#### 4. Edit preferences of Qt

##### 4-1. Target preferences

```
/usr/lib/x86_64-linux-gnu/qt-default/qtchooser/default.conf
```

##### 4-2. Modified part

```
// Before (Default)
```

```
/usr/lib/x86_64-linux-gnu/qt4/bin <- This line!
```

```
/usr/lib/x86_64-linux-gnu
```

```
// After
```

```
/opt/Qt5.10.1/5.10.1/gcc_64/bin
```

```
/usr/lib/x86_64-linux-gnu
```

#### 5. Set paths for Qt

##### 5-1. Editing of .profile

â€œ» Please edit this according to your environment

```
export QT_PATH=/opt/Qt5.10.1
```

```
export PATH=$PATH:$QT_PATH/5.10.1/gcc_64/bin
```

```
export LD_LIBRARY_PATH=$QT_PATH/5.10.1/gcc_64/lib
```

```
export QMLSCENE_DEVICE=softwarecontext
```

##### 5-2. Reboot or activation by "\$source .profile"

How to confirm paths

```
$ echo $PATH
```

#### 6. Check Qt environment

Please run and check sample programs for OpenGL attached in Qt

## FOR HARMONICS

#### 7. Install CSPICE

##### 7-1. Download

```
https://naif.jpl.nasa.gov/naif/toolkit\_C\_PC\_Linux\_GCC\_64bit.html
```

```
// Target files
```

```
cspice.tar.Z
```

```
importCSpice.csh
```

```
// about installation of CSPICE
```

```
https://naif.jpl.nasa.gov/pub/naif/toolkit/C/PC\_Linux\_GCC\_64bit/packages/README
```

Set paths after extraction.

##### 7-2. Set up downloaded files to suitable place

e.g. `~/tmp/setup/cspice`

```
// Run followings
```

```
$ /bin/sh -f importCSpice.csh
```

cspice.tar and cspice directory are set up.

##### 7-3. Set paths by editing .profile according to your environment

```
// e.g.
```

```
# CSPICE
```

```
export CSPICE_PATH=$HOME/tmp/setup/cspice/cspice
export PATH=$PATH:$CSPICE_PATH/lib:$CSPICE_PATH/include:$CSPICE_PATH/exe
```

## 8. Install CFITSIO

### 8-1. Download

<https://heasarc.gsfc.nasa.gov/fitsio/fitsio.html>

Unix .tar file cfitsio3450.tar.gz

// Target file

cfitsio3450.tar.gz

// Set up

\$HOME/setup/cfitsio

// Extraction

```
$ tar xvf cfitsio3450.tar.gz
```

### 8-2. Install log

Install cfitsio according to your environment.

```
$ cd cfitsio/
```

```
$ ./configure --prefix=/usr/local
```

```
$ make
```

```
$ sudo make install
```

// sudo make install

```
/bin/cp -a libcfitsio.a /usr/local/lib
```

```
/bin/cp fitsio.h fitsio2.h longnam.h drvrsmem.h /usr/local/include
```

```
/bin/cp cfitsio.pc /usr/local/lib/pkgconfig
```

## 9. Install CCFITS

### 9-1. Download

<https://heasarc.gsfc.nasa.gov/docs/software/fitsio/ccfits/>

CCfits source code, documentation and the html manual for local

From the installation link

// Target file

cfitsio3450.tar.gz

// Set up

\$HOME/setup/ccfits

// Extraction

```
tar xvf CCfits-2.5.tar.gz
```

### 9-2. Install log

Install CCfits according to your environment.

```
$ cd CCfits/
```

```
$ ./configure --with-cfitsio=/usr/local
```

```
$ make
```

```
$ sudo make install
```

## 10. Run HARMONICS

Set up harmonics

Open HARMONICS2\_linux.pro

Build it and confirm execution

## References URL

// How to install Qt (JPN)

<https://download.qt.io/archive/qt/5.10/5.10.1/>

<http://kconcon3.hatenablog.com/entry/2017/12/01/190933>

// How to install CFITSIO (JPN)

[http://hamalabo.sakura.ne.jp/SPIRAL/spiraf\\_vine/node18.html](http://hamalabo.sakura.ne.jp/SPIRAL/spiraf_vine/node18.html)