File: Installation_notes.pdf
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Here, we will describe some tips for the installation (Linux ubuntu 18.04). Our Flow Composed Implicit Runge-Method (FCIRK) implementation is developed in C-programming language and the integration method is interfaced via Jupyter/Julia powerful computational enviroment.

You can install FCIRK application and Julia packages by "installation_Notebook.ipyn" Jupyter notebook but previously, you must install some C special libraries, Julia programming language and Jupyter tool.

Language C

We use some special library that you must be installed:

(1) **uuid-dev**

install by synaptic tool

libjug-java		3.1.5-1	Pure java UUID generator
cl-uuid		20130813-1	Common Lisp librabry for generation of UUIDs as described by RFC 4122
libcrossguid-dev		0.0+git200150803-7	C++ UUID library headers
libcrossguid0		0.0+git200150803-7	C++ UUID library
libghc-uuid-prof		1.3.13-2build3	create, compare, parse and print UUIDs; profiling libraries
uuid-dev	2.31.1-0.4ubuntu3.7	2.31.1-0.4ubuntu3.7	Universally Unique ID library - headers and static libraries
uuid-runtime	2.31.1-0.4ubuntu3.7	2.31.1-0.4ubuntu3.7	runtime components for the Universally Unique ID library
golang-github-nu7hatch-gouui		0.0~git20131221.0.	pure Go UUID implementation as specified in RFC 4122
libghc-uuid-types-doc		1.0.3-4build1	Type definitions for Universally Unique Identifiers; documentation
libuuid-perl	0.27-1build1	0.27-1build1	Perl extension for using UUID interfaces as defined in e2fsprogs
libghc-uuid-types-dev		1.0.3-4build1	Type definitions for Universally Unique Identifiers
libghc-uuid-types-prof		1.0.3-4build1	Type definitions for Universally Unique Identifiers; profiling libraries
libghc-uuid-dev		1.3.13-2build3	create, compare, parse and print Universally Unique Identifiers
ruby-uuidtools		2.1.5-2	UUIDs generation library for Ruby
ruby-uuidtools-doc		2.1.5-2	UUIDs generation library for Ruby - documentation

(2) **quadmath library**
Quad-Precision Math Library Application Programming Interface (API).
https://gcc.gnu.org/onlinedocs/libquadmath/#toc-Typedef-and-constants-1

(3) **mpfr library**
MPFR is a portable library written in C for arbitrary precision arithmetic on floating-point numbers. The MPFR library is already installed on some GNU/Linux distributions and "How to Install" instructions, are explained in "GNU MPFR" manual.

(4) **OpenMP Application Programming Interface**
OpenMP API for parallelism in C, C++ and Fortran programs. Most of Compilers support Open API. http://www.openmp.org

Jupyter/Julia computational enviroment

(1) Julia.

We use Julia 1.1.0 version (http://julialang.org).

Additionally, these packages must be install:

```
Pkg.add("NBInclude")
Pkg.add("Plots")
Pkg.add("Dates")
Pkg.add("DelimitedFiles")
Pkg.add("LinearAlgebra")
```

(2) Jupyter.

We build our experiments on Jupyter notebooks (an open source tool for interative computing) using Julia programming language.

To install

```
$ julia
        julia> ]
        pkg> add IJulia
        julia>using IJulia
        julia>notebook()
        julia>exit()
```

To execute:

```
$ jupyter notebook
```