

User Interface



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GEANT4 User Interface Commands

- Consists of command directory, **command**, and **parameter(s)**

`/vis/viewer/flush`

`/run/verbose |`

- **parameter:**
 - use double quotes ("") for string with a space (see the next slide)
 - If a parameter is omitted, the default value is used (Default value is either pre-defined value or current value).
 - If the first parameter is default but you want to set the second parameter, use “!” as a place holder.

Ex: `/dir/command ! second_param`

How to issue a command

- GUI interactive command
- Can be defined in a macro file
- Hard-coded in the source code (but this is slow. Not recommended to do it in a event loop).

```
G4UImanager* UI = G4UImanager::GetUIpointer();
```

```
UI->ApplyCommand("/run/verbose 1");
```

Macro File

- ASCII file which contains UI commands
- A line starting with '#' is commented. (but this line will be printed to the screen upon execution of a macro if /control/verbose is set to 2)
- How to execute a macro file
 1. interactively: /control/execute macro_file_name
 2. hard-coded in the source file:

```
G4UImanager* UI = G4UImanager::GetUIpointer();
```

```
UI->ApplyCommand("/control/execute macro_file_name");
```

Command Descriptions and Help

- 'help' command (easy to use. Just select the number)
- List of available commands with descriptions is shown by the following command:

`/control/manual [directory_name]`

- Can create a html file for each command:

`/control/create_HTML [directory_name]`

- See Sec. 7.1 of User's Guide for a list of available commands

Alias

- ▶ Alias can be defined by
 - `/control/alias [name] [value]`
 - ▶ It is also set with `/control/loop` and `/control/foreach` commands
 - ▶ Aliased value is always treated as a string even if it contains numbers only.
- ▶ Alias is to be used with other UI command (and macro files).
 - ▶ Use curly brackets, `{` and `}`.
 - ▶ For example, frequently used lengthy command can be shortened by aliasing.

```
/control/alias trv "/tracking/verbose"
```

```
{trv} 1
```

- ▶ Aliases can be used recursively.

```
/control/alias file1 /diskA/dirX/fileXX.dat
```

```
/control/alias file2 /diskB/dirY/fileYY.dat
```

```
/control/alias run 1
```

```
/myCmd/getFile {file{run}}
```

Loop

- ▶ `/control/loop` and `/control/foreach` commands execute a macro file more than once. Aliased variable name can be used inside the macro file.
- ▶ `/control/loop [macroFile] [counterName]`
`[initialValue] [finalValue] [stepSize]`
 - ▶ `counterName` is aliased to the number as a loop counter
- ▶ `/control/foreach [macroFile] [counterName] [valueList]`
 - ▶ `counterName` is aliased to a value in `valueList`
 - ▶ `valueList` must be enclosed by double quotes (" ")
- ▶ on UI terminal or other macro file
`/control/loop myRun.mac Ekin 10. 20. 2.`
- ▶ in myRun.mac
`/control/foreach mySingleRun.mac pname "p pi- mu-"`
- ▶ in mySingleRun.mac
`/gun/particle {pname}`
`/gun/energy {Ekin} GeV`
`/run/beamOn 100`

G4UITerminal

- ▶ G4UITerminal is a concrete implementation derived from G4UIsession abstract base class. It provides character-base interactive terminal functionality to issue Geant4 UI commands.
 - ▶ C-shell or TC-shell (Linux only)
`new G4UITerminal(new G4UITcsh) ;`
 - ▶ For Windows
`new G4UIWin32() ;`
- ▶ It supports some Unix-like commands for directory.
 - ▶ **cd, pwd** - change and display current command directory
 - ▶ By setting the current command directory, you may omit (part of) directory string.
 - ▶ **ls** - list available UI commands and sub-directories
- ▶ It also supports some other commands.
 - ▶ **history** - show previous commands
 - ▶ **!historyID** - re-issue previous command
 - ▶ **arrow keys** (TC-shell only) **Upper arrow key to recall previous commands**
 - ▶ **?UIcommand** - show current parameter values of the command
 - ▶ **help [UIcommand]** - help
 - ▶ **exit** - job termination
- ▶ Above commands are interpreted in G4UITerminal and are not passed to Geant4 kernel. You **cannot** use them in a macro file.