flair for FLUKA

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About

/fleə(r)/ n [U,C] natural or instinctive ability (to do something well, to select or recognize what is best, more useful, etc.

[*Oxford Advanced Dictionary of Current English*]

What is flair [1/2]

- **FLUKA Advanced Interface**
- **All-in-one** Graphical Interface
- With minimum requirements on additional software
- Working in an intermediate level: **Not hiding the inner functionality of FLUKA**

Front-End interface:

- **Input file Editing**
  - mini-dialogs for each card, allows easy and almost error free editing
  - Card grouping in categories and card filtering
  - Error checking and validation of the input file during editing;
- **Geometry: transformation, optimizations and debugging**
- **Compilation of the FLUKA Executable**
- **Running** and **monitoring** of the status of a/many run(s)

What is flair [2/2]

Back-End interface:

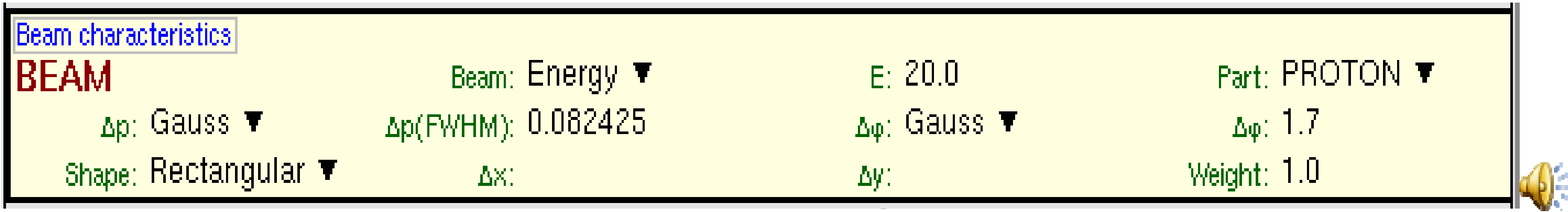
- Inspection of the output files
- Post processing (merging) the output data files
- Plot generation through an interface with gnuplot or 3D photo-realistic images with PovRay (ToDo)
  Input information, USRxxx, RESNUCLEI and geometry

Other Goodies:

- **Access to FLUKA manual as hyper text**
- **Checking for updates and validating the FLUKA and flair installation (ToDo)**
- **Nuclear wallet cards**
- **library** of **materials** and **geometrical objects (ToDo)**
- Programming python **API**

Flair Concepts

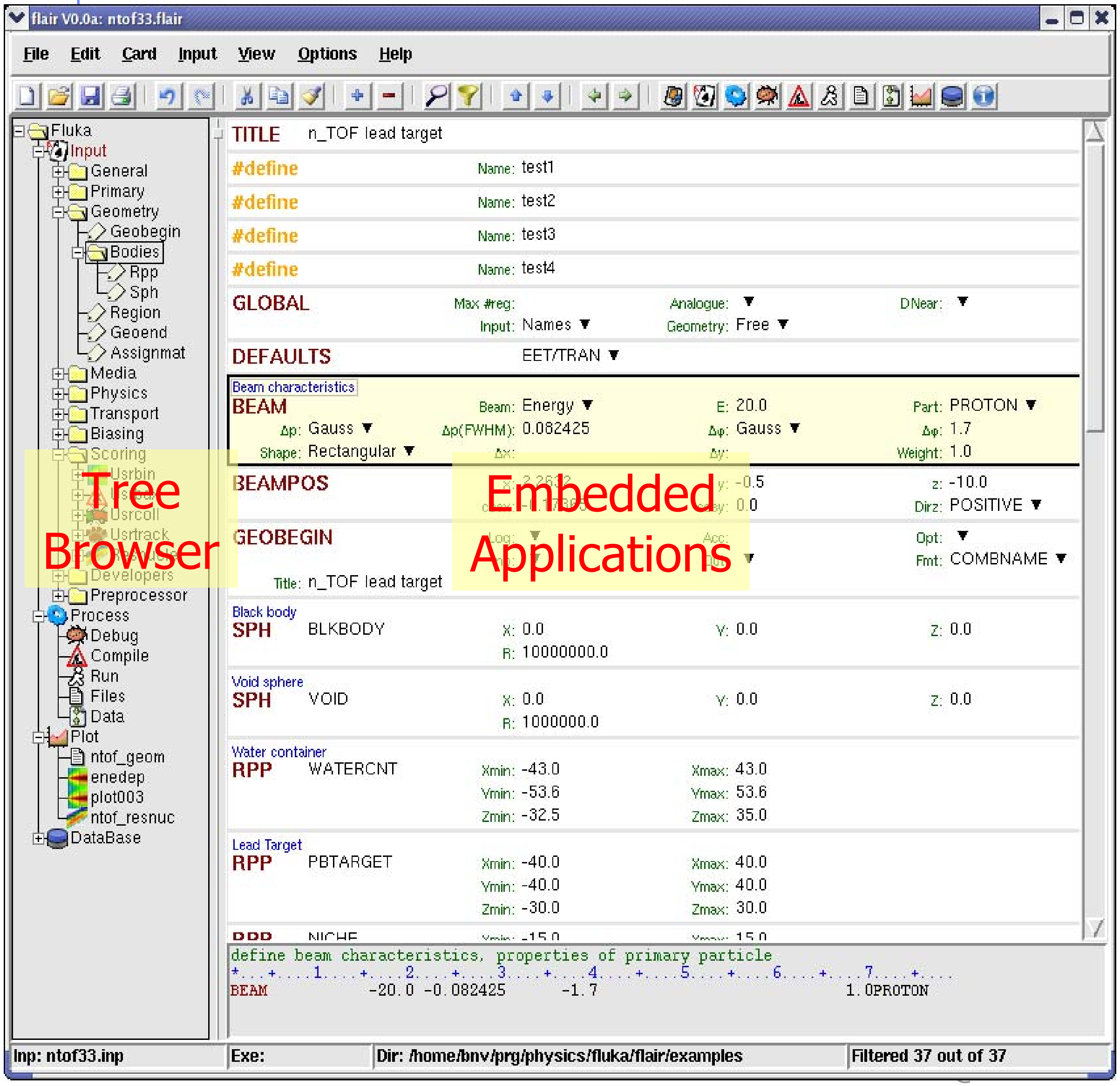
- **FLUKA Project**
  - **Store in a single file all necessary information + procedures: input file, running of the code, data merging rules and plot generation**
  - **Flair is an editor for the FLUKA project files.**
  - **Uses the names format for the input, free with names for the geometry**
- **Extended Cards**
  - **Flair is treating the input file as a list of extended cards**
  - **Each extended card contains:**
    - **Comment (All commented lines preceding the card)**
    - **Tag and Multiple number of whats (0=sdum, 1-6 first line, 7-12 continuation line…) and one field of extra information (multi line string)**



Beam characteristics

BEAM		Beam:	Energy ▼	E:	20.0	Part:	PROTON ▼
Δp:	Gauss ▼	Δp(FWHM):	0.082425	Δφ:	Gauss ▼	Δφ:	1.7
Shape:	Rectangular ▼	Δx:		Δy:		Weight:	1.0

Program Interface



Tree Browser

Embedded Applications

TITLE n_TOF lead target

#define Name: test1

#define Name: test2

#define Name: test3

#define Name: test4

GLOBAL Max #reg: Analogue: DNear: Input: Names Geometry: Free

DEFAULTS EET/TRAN

Beam characteristics
BEAM Beam: Energy E: 20.0 Part: PROTON Δp: Gauss Δp(FWHM): 0.082425 Δφ: Gauss Δφ: 1.7 Shape: Rectangular Δx: Δy: Weight: 1.0

BEAMPOS x: 2.2632 y: -0.5 z: -10.0 cosx: -0.17365 cosy: 0.0 Dirz: POSITIVE

GEOBEGIN Log: Acc: Opt: Inp: Out: Fmt: COMBNAME Title: n_TOF lead target

Black body
SPH BLKBODY x: 0.0 y: 0.0 z: 0.0 R: 10000000.0

Void sphere
SPH VOID x: 0.0 y: 0.0 z: 0.0 R: 1000000.0

Water container
RPP WATERCNT Xmin: -43.0 Xmax: 43.0 Ymin: -53.6 Ymax: 53.6 Zmin: -32.5 Zmax: 35.0

Lead Target
RPP PBTARGET Xmin: -40.0 Xmax: 40.0 Ymin: -40.0 Ymax: 40.0 Zmin: -30.0 Zmax: 30.0

RPP NICHE Xmin: -15.0 Xmax: 15.0

```
define beam characteristics, properties of primary particle
*...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....
BEAM          -20.0  -0.082425      -1.7                               1.0PROTON
```

Inp: ntof33.inp | Exe: | Dir: /home/bnv/prg/physics/fluka/flair/examples | Filtered 37 out of 37

- Wrapper of standalone applications
- Tree browser to select application
- Allow different ways of viewing the same object
- Input:
  - Filtering Cards
  - Show card links
  - Units: i.e. 20 GeV/c (ToDo)
  - Data validation
  - Import/Export on various formats
- Process:
  - Debugging
  - Compilation
  - Run monitoring
  - Merging
- Plotting:
  - Interface to plot packages
  - Table of Isotopes
- Python Libraries:
  - Input file manipulation
  - Processing
  - Plotting

Download & Requirements

- Flair web site to download code and documentation

  http://www.fluka.org/flair

  Until the official release, is preferable to use the CVS repository with the instruction in the download section of the web site

- Installation
  - Unpack the code in a directory of your choice i.e. /usr/local/flair
  - Create an alias to the flair executable in your login script

    alias flair=/usr/local/flair/flair

- Besides the latest FLUKA version flair requires:
  - Python interpreter (≥2.3) (http://www.python.org). Present on almost all linux and unix systems.
  - Tkinter with Tk/Tcl (≥8.4) usually is included in the python distribution. Some linux versions distribute it as a separate package.
  - Gnuplot (≥4.0) (http://www.gnuplot.info) (and gplevbin substitute of pawlevbin)
  - PovRay (≥3.6) (http://www.povray.org) (Optional)

ToDo: Features to be added

- Interface
  - Working on multiple projects
  - Configuration dialog
  - Exportation of processing scripts and various formats (MCNP...)
- Input Editor
  - Undo/Redo
  - Show hidden cards
  - Smart completion of bodies in region definition
  - Geometry manipulation (Transformations, CSG optimization etc)
- Post Processing
  - Re-binning or USRBINs
  - Maximum trace
- Plotting:
  - Information of Input File
  - Double differential quantities (USRBDX, USRYIELD...)
  - 3D Ray Tracing interface to povray
  - Particle tracks

How to Contribute

- Python programming
  - Parsing and processing output files
  - Web based database for sharing resources with other users
  - …
- Input Editor
  - Cards Layout, in other formats (from 3 up to 8 columns)
  - Labels have to be intuitive, if something is not comprehensible please propose an alternative
- Manual, Online documentation, Tips database
- Icons for tool bars and cards
- Gnuplot scripts or ideas for better presentation
- Comments & Ideas, on new features that one wants to see
- **Testing, Bug reporting**
- …