

# *Graphics User Interface for Geometry*

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# Goals

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- Creating a user-friendly interface to access geometry information
  - Make easier geometry editing and debugging
  - Allow creation of geometry objects and assembling a valid geometry structure
- Providing access to most useful TGeo features
  - Geometry checker, visualization, ...

# GED Structure

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- Following ROOT **GED** (**G**raphics **E**ditors) implementation
  - Object editor classes must follow the class naming rule: **<ClassName>Editor** (TGeoManagerEditor)
    - Allows finding the required editor if a class with this name is in memory
  - Clicking a drawn object performs:
    - **Instantiates** the editor class (if existing) in the **editor tab**
    - **Updates** the editor widgets to reflect the clicked object
    - **Hides** all other existing editors not suitable for the object
  - One editor per class, reused by all edited objects of that type

# Geometry editors

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- Probably most complex use case of GED
  - About 40 required editors for shapes, volumes, nodes, manager, matrices, ...
  - Editors must be inter-connected and shown ONLY when needed
  - Editing actions must be reflected by graphics
- Preliminary design and implementation for the moment
  - Still in discussion
  - Describing connectivity between main editors
  - Providing functionality at basic level
  - Not yet in CVS

# How it works

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- Starting editing:
  - Geometry must exist in memory
  - `gGeoManager->Edit(Option_t *opt="")`
    - Starts the TGeoManager editor
      - Provides possibility to edit all existing geometry objects
      - Provides the interface for creating new objects
  - `Volume->Draw()` + click on a drawn volume
    - Starts the TGeoVolume editor
      - Provides possibility to edit shape and medium
      - Access for editing/adding/moving/removing daughters

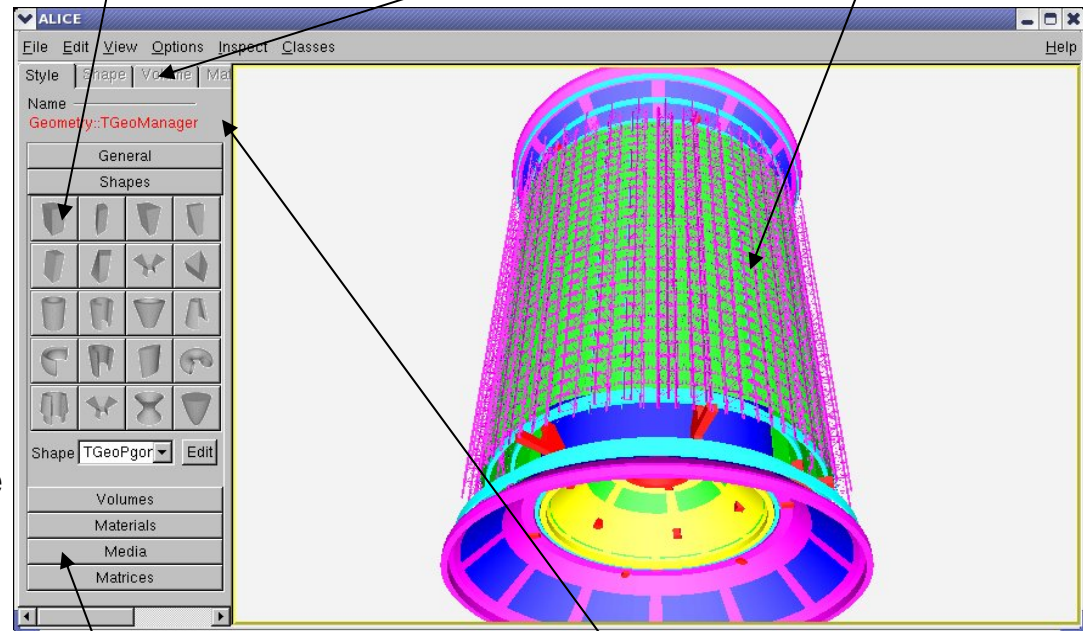
# Editor tabs and categories

- One tab for each geometry object type editor
- One shutter item for each category in the manager editor
  - Other categories available also in the volume editor
- A shape is always edited in the “Shape” tab
  - Editor creation and update done by a single tab manager class

Shape creators

Editor tabs

Click-and-edit  
GED mechanism

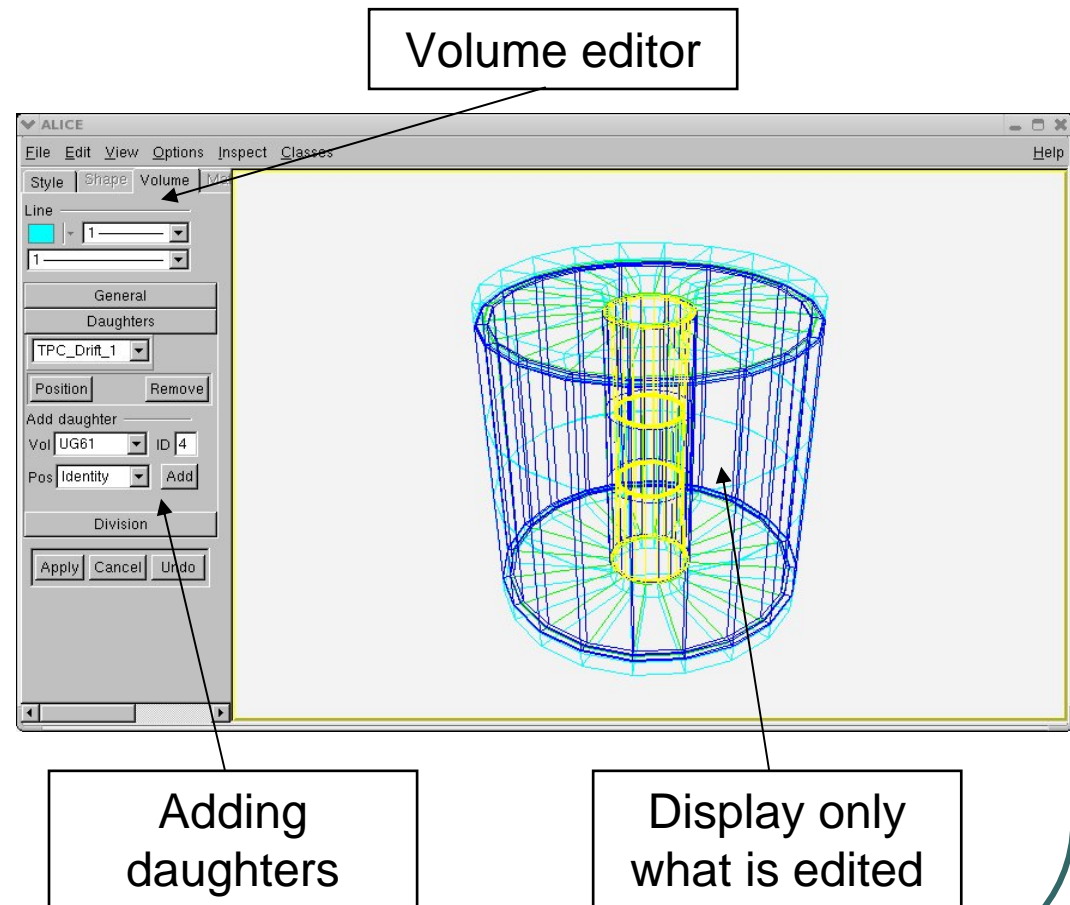


Categories  
per editor

TGeoManagerEditor  
(main builder class)

# Geometry builder interface

- Deals with creation of all types of geometry objects
- Objects are generally created with some default parameters
  - `TGeoBBox(1.,1.,1.)`
- Upon object creation, its editor is invoked and the corresponding tab becomes current



## Current status

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- Editor implementation done for main TGeo classes
  - Just basic functionality at this stage
- Possibility to create some shapes, materials, media, matrices and volumes
  - Interface to create volume hierarchy
- Design under discussion with ROOT team



## To Do

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- A bit of re-design
  - “Too many tabs” – maybe some will become transient frames
  - “Big lists of volumes, shapes, ...” – TGComboBox not appropriate
- Implementing one by one the missing editors
- Putting in more functionality and correlating with graphics (OpenGL ?)