

AGDD

random ideas & observations

- **Transformations**
- **Solids**
- **Role of XML**
 - **Other XMLs**
- **Completeness**
- **Correctness and Validity**
- **Geant4 -> AGDD**

Transformations

<transform volume="abc"
pos="abc_pos"
rot="abc_rot"/>

<pos name="abc_pos"
vector="0.0 0.0 0.0"/>

<rot name="abc_rot"
matrix="1.0 0.0 0.0
0.0 1.0 0.0
0.0 0.0 1.0"/>

<rot name="abc_rot"
axis="1.0 0.0 0.0"
angle="90"/>

Transformations (2)

- *Other possibilities:*
 - *4x4 matrix:*
 - *contains translation + rotation + anisotropic scaling + shearing + inversion*
 - *easy to manipulate*
 - *transparent*
 - *big*
 - *quaternion:*
 - *contains rotation*
 - *compact*
 - *fast*
 - *confusing*

Solids

- ***As close as possible to Geant4***
- ***there is no reason to invent/learn anything else***
- ***it will make HEP-wide collaboration easier***
- ***both C++ and Java implementation of Geant4 volumes exist***

Role of XML

- ***XML as interchange format***
 - ***not main source of information***
 - ***protection against DTD changes***
 - ***can be used to input data, output data, share data, edit data, interchange data***

Other XMLs

direct correspondence to Event classes

atlasevent.dtd

<TruthTrack .../>

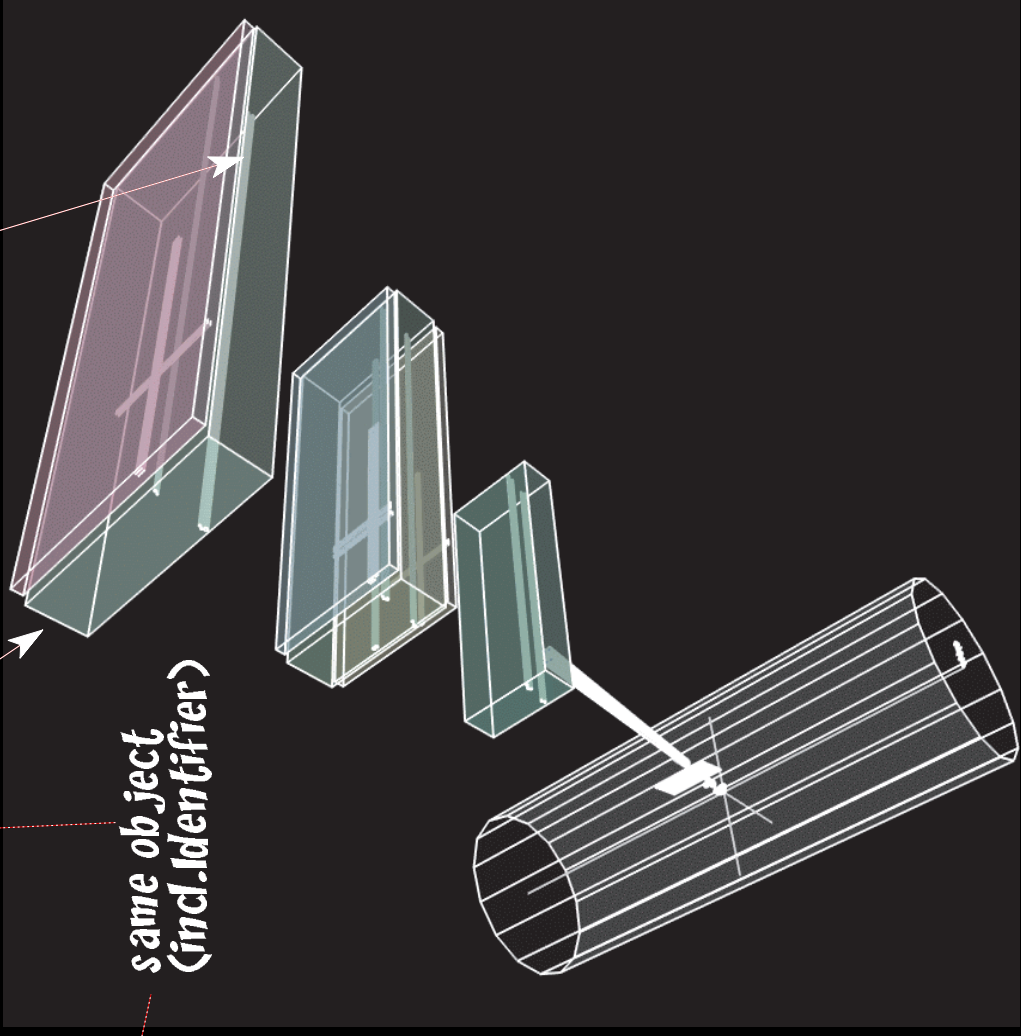
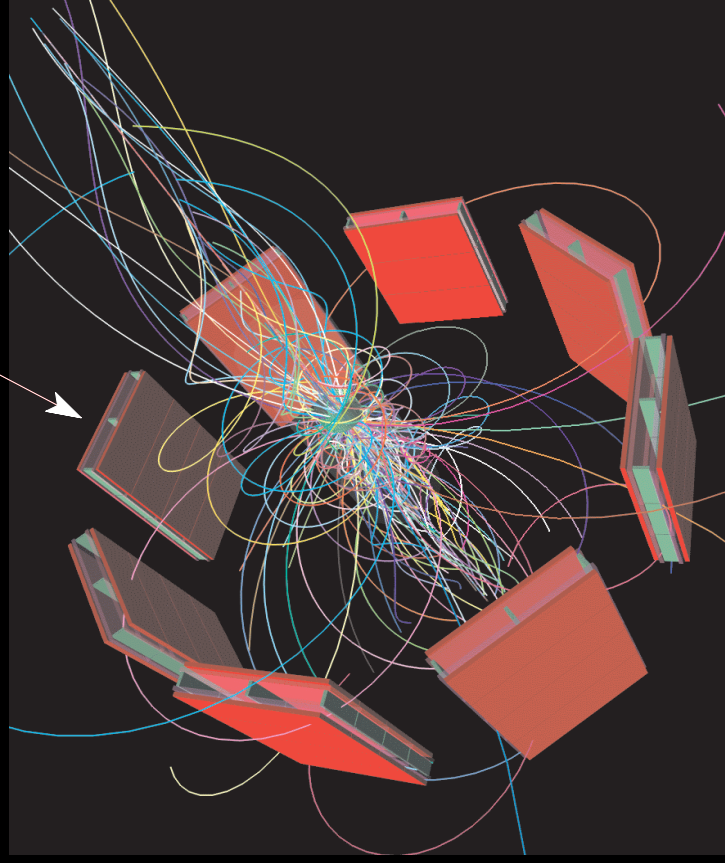
<MDTDetector .../>

<MDTDigit .../>

AGDD.dtd

<composition ...>
<box .../>
</composition>

*same object
(incl.Identifier)*



Completeness

- ***XML file should be complete***
 - ***no implicit choices***
 - ***no magic numbers (which need interpretation by system/application specific code)***
 - ***XML files should contain all (needed) information***

Validity and Correctness

- Each XML file should be correct and valid
- rarely case today
- most XML files have syntactical errors

```
<box name="MyBox">
```

```
x_y_z="200.300.285."
```


Geant4 -> AGDD

- ***AGDD XML generator from Geant4***
 - ***written in Alice (but independent on Root)***
 - ***Geant3 -> Geant4 -> XML***
 - ***just 3 classes:***
 - ***TGXMLGeometryGenerator***
 - ***TG4XMLConverter***
 - ***TG4VXMLConverter***
 - ***flexible for change of DTD***
- ***several changes (extensions) to AGDD required, creating AliDD.dtd:***
 - ***all Geant4 Solids***
 - ***general transformations (via matrix)***
 - ***envelopes (simulated in code)***

Alice Geometry created from Geant4 in GraXML

