SPENVIS JAVA
Geometry Definition Tool

Laszlo Hetey

Belgian Institute for Space Aeronomy

8 June 2010

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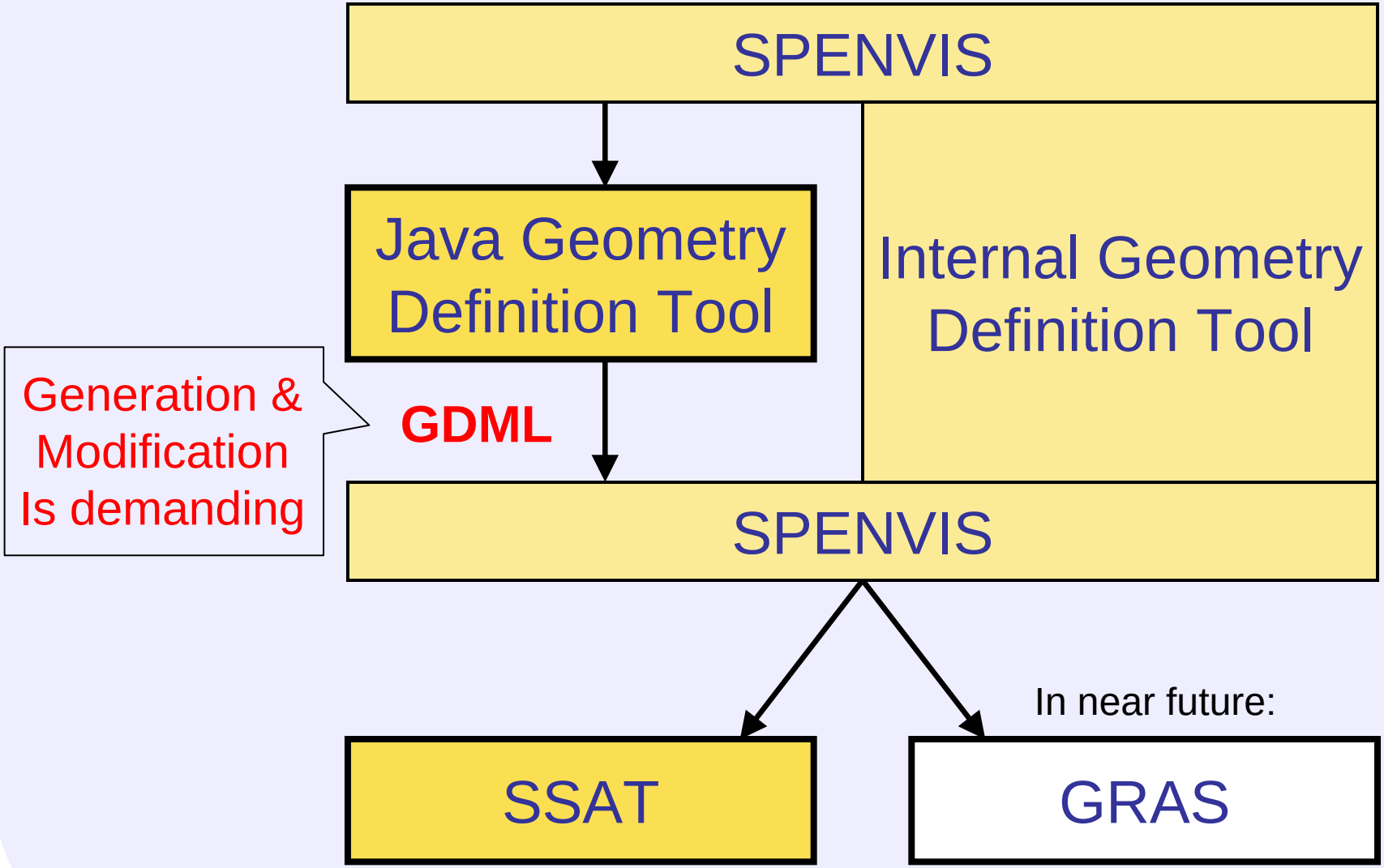
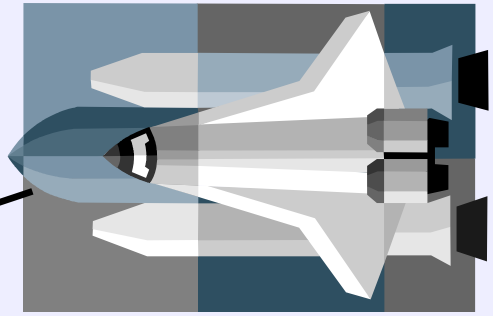
Motivation


SPENVIS
Java Geometry Definition Tool
Internal Geometry Definition Tool
Generation & Modification Is demanding
GDML
SPENVIS
In near future:
SSAT
GRAS

Motivation

Easy to use

Geometry Definition Tool



Real-time Visualisation of the models

In-/Export

Export

Load / Save
In binary format

GDML
(GEANT4 format)

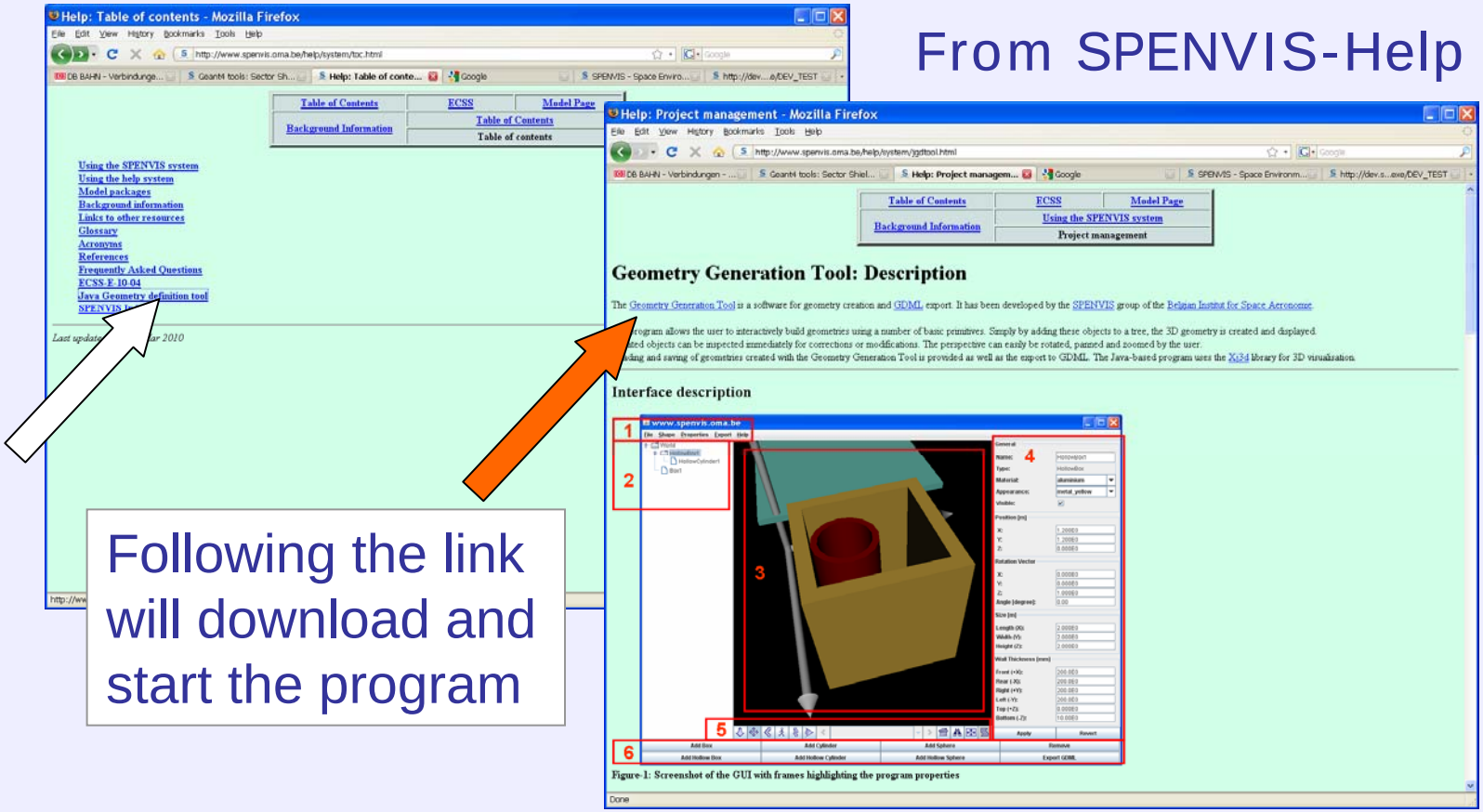
GMSH
(CAD format)

aeronomie.be

.be

Availability

From SPENVIS-Help

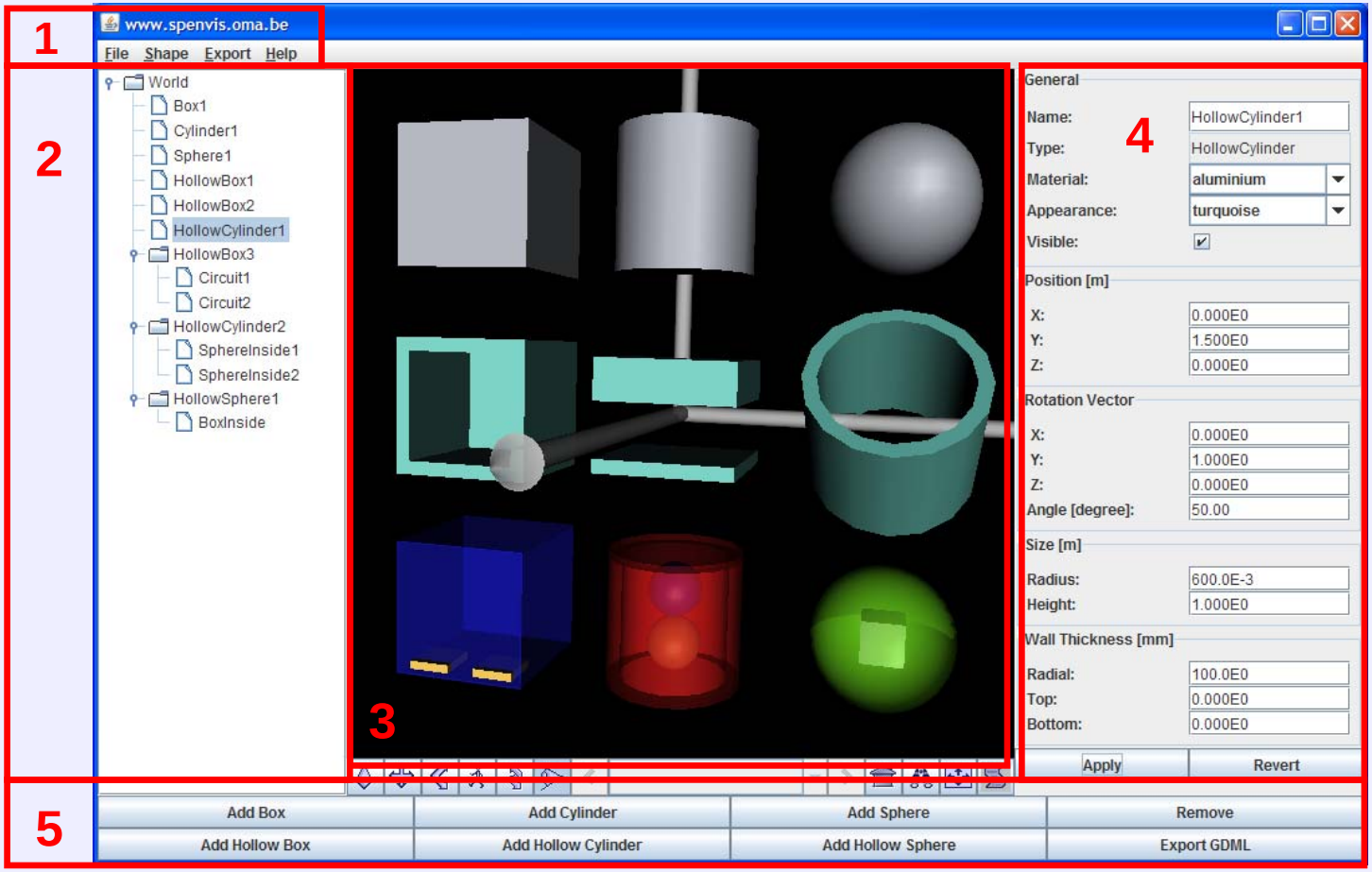


Following the link will download and start the program

http://www.spenvis.oma.be/download/jgdtool/beta/WP430.jnlp

Requires: Java Web-Start 6.0+ & Internet Connection

Program Functionality



- 1: Menu bar
- 2: Tree panel
- 3: Visualisation panel
- 4: Property panel
- 5: Action buttons

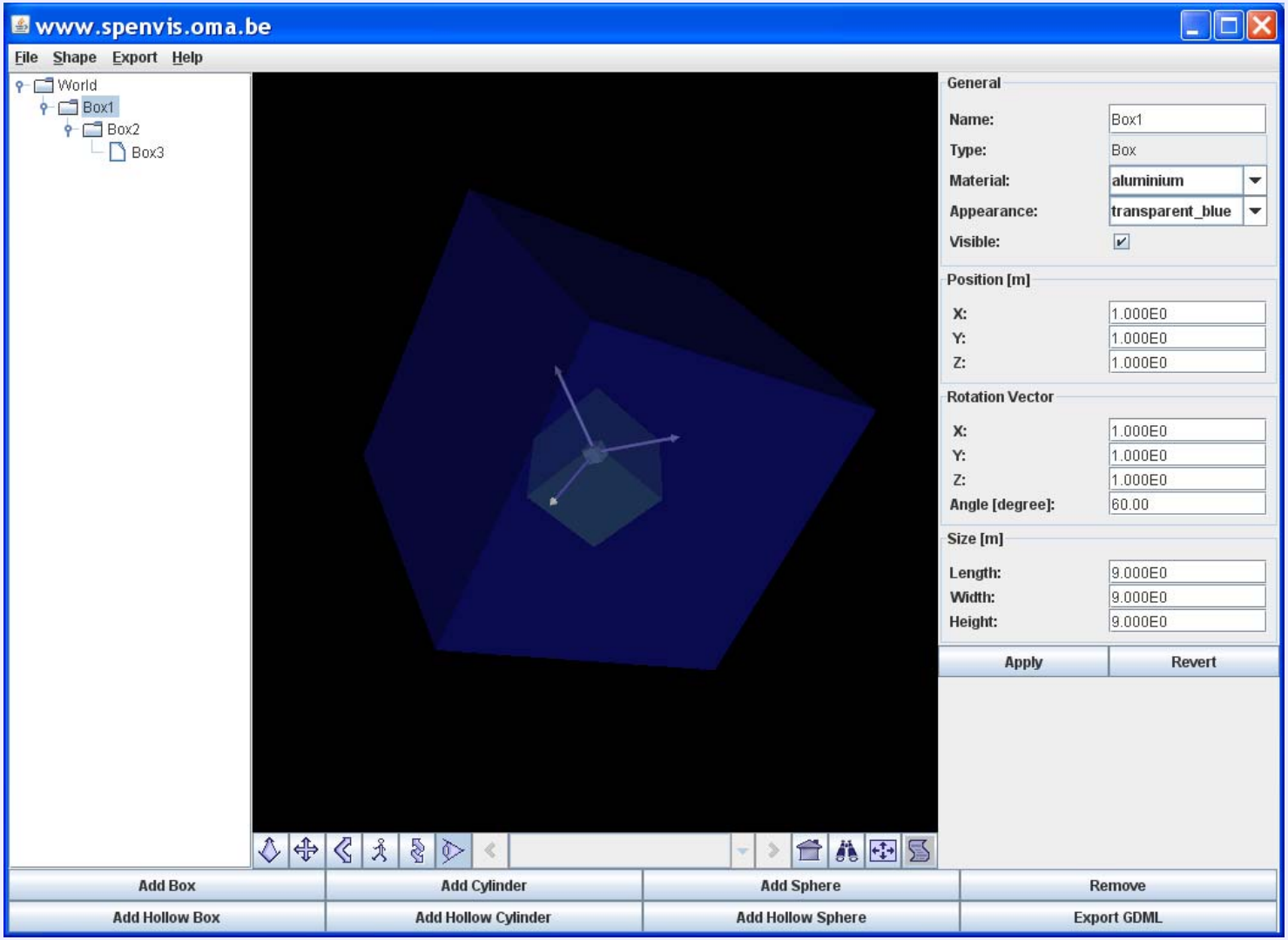
GDML Generation & Validation

- GDML (Geometry Description Markup Language) is XML based meta-language used to run GEANT4 analyses
- Shape-based geometry definition, not node-based

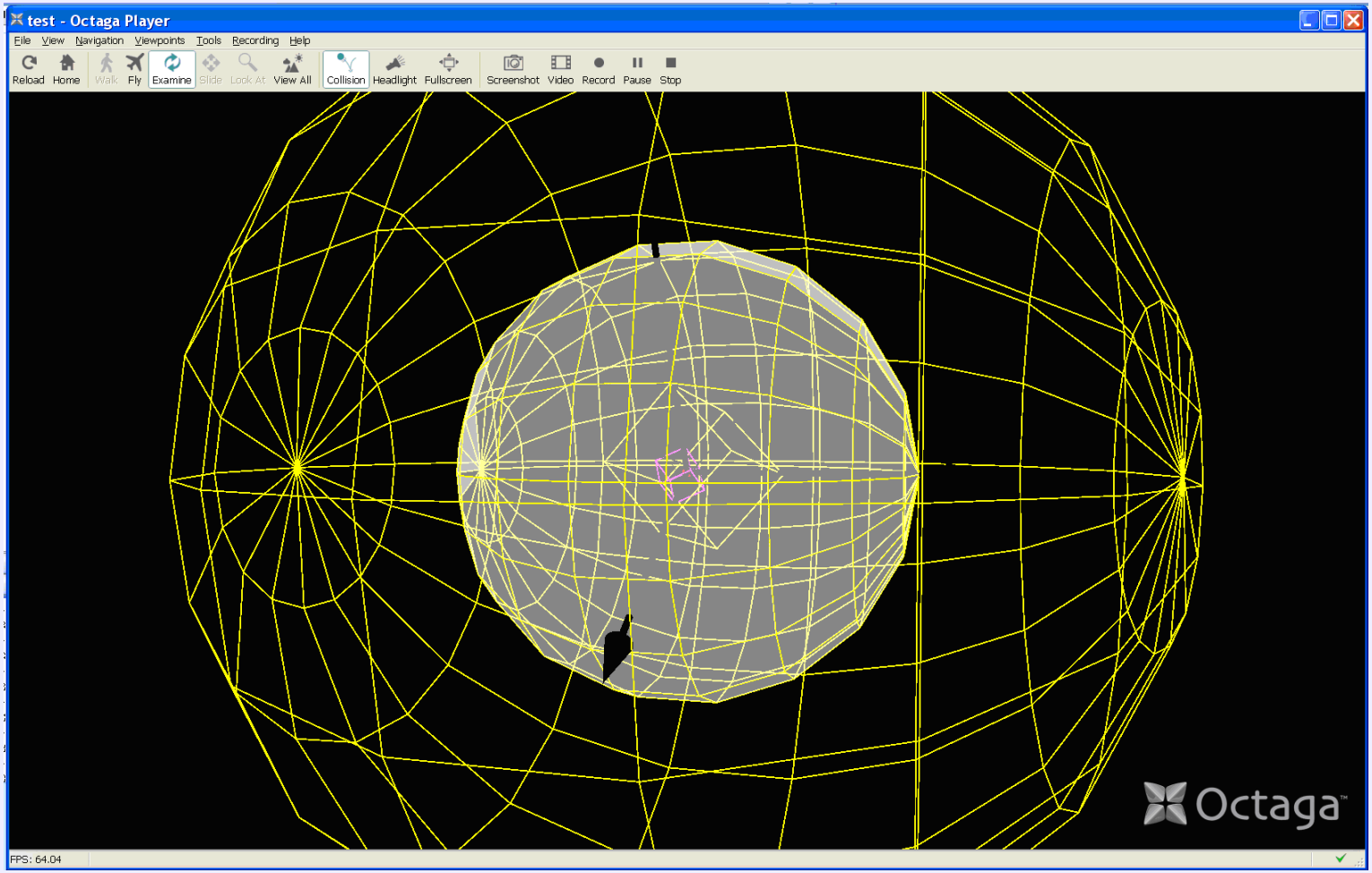
```
<?xml version="1.0" encoding="UTF-8"?>
<gdml xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance“
    xsi:noNamespaceSchemaLocation="http://service-spi.web.cern.ch/
    service-spi/app/releases/GDML/schema/gdml.xsd">
<define>
  <constant name="PI" value="3.141592653589793" />
  <position name="_pos_Box1" x="1.0" y="1.0" z="1.0" unit="m" />
  <rotation name="_rot_Box1" x="0.1476*PI" y="0.2323*PI“ z="0.1476*PI" />
</define>
...
```

- DAWN & DAVID (GEANT4 tools) check for logical errors
- Test case: three_boxes: 3 rotations & 3 translations along (1,1,1)

GDML: Three-Boxes Test Case



Spenvis GDML Creation

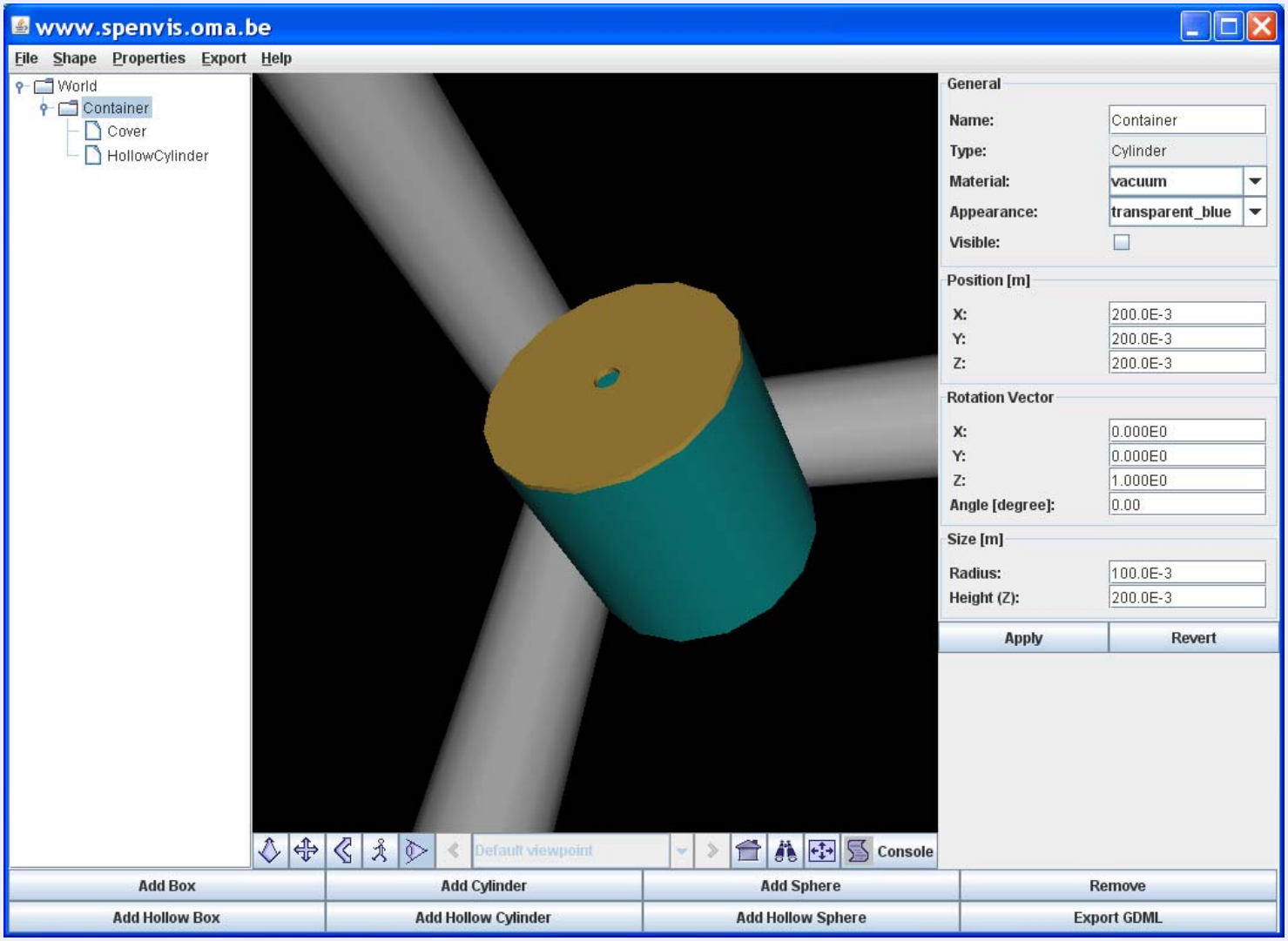


- Using “current” Spenvis the three_boxes test case generates **wrong GDML**

SSAT Example

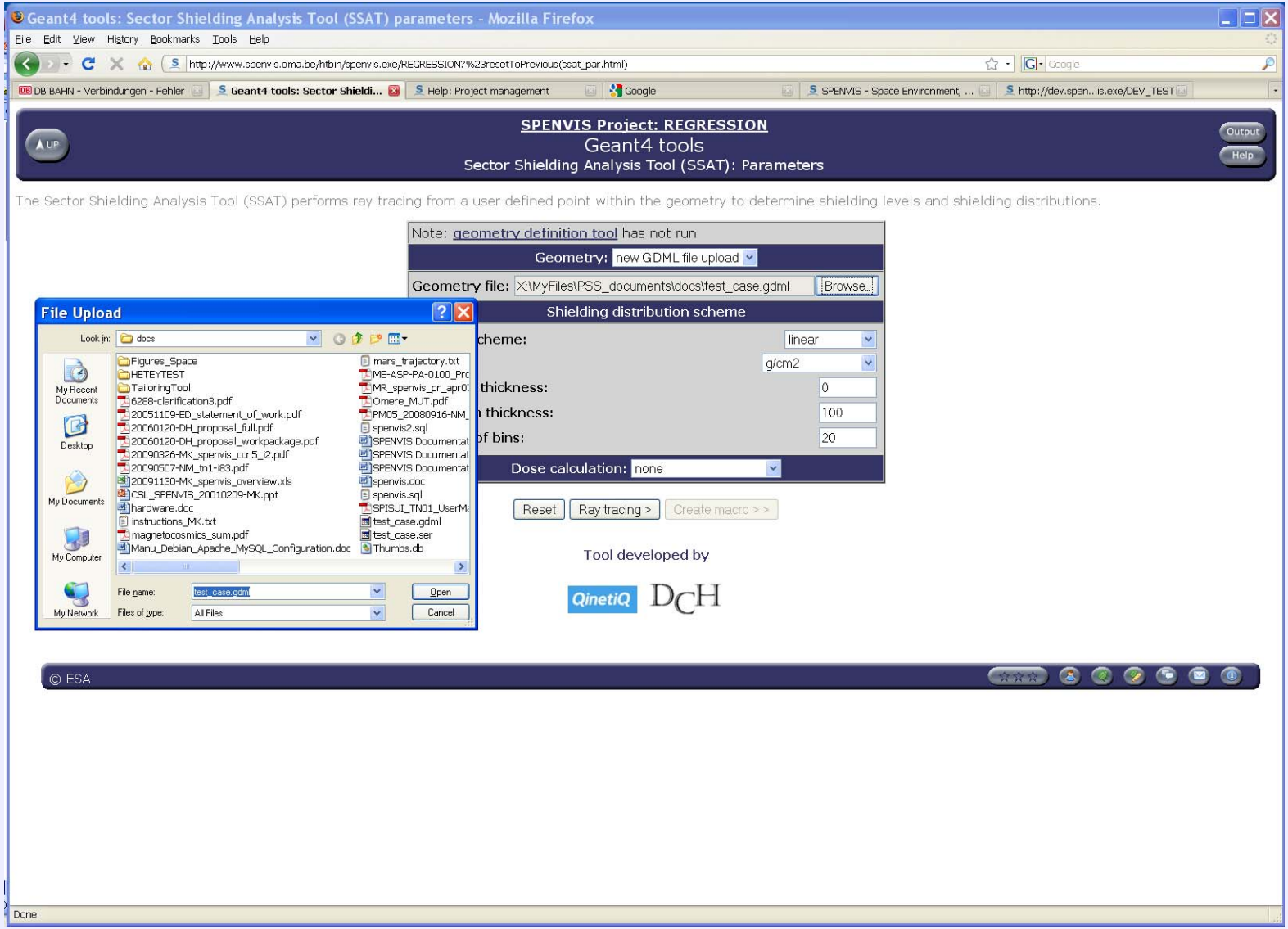
- SSAT = Sector Shielding Analysis Tool (GEANT4)
- Performs ray-tracing from internal point
- Example geometry is a Hollow-Cylinder
- Aim: calculate the shielding

SSAT Example: GDML Creation

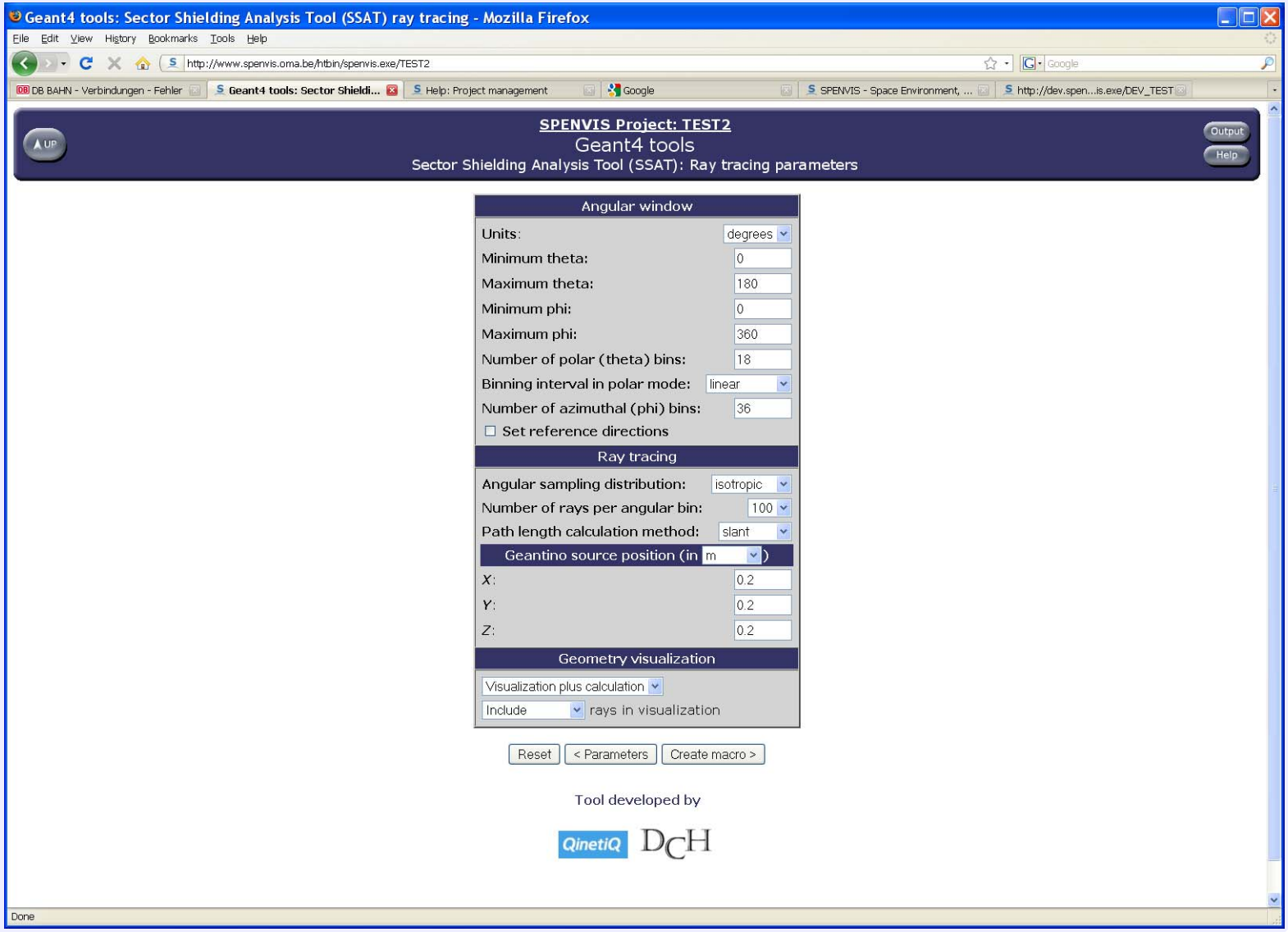


Hole on top, cover and main body from different materials

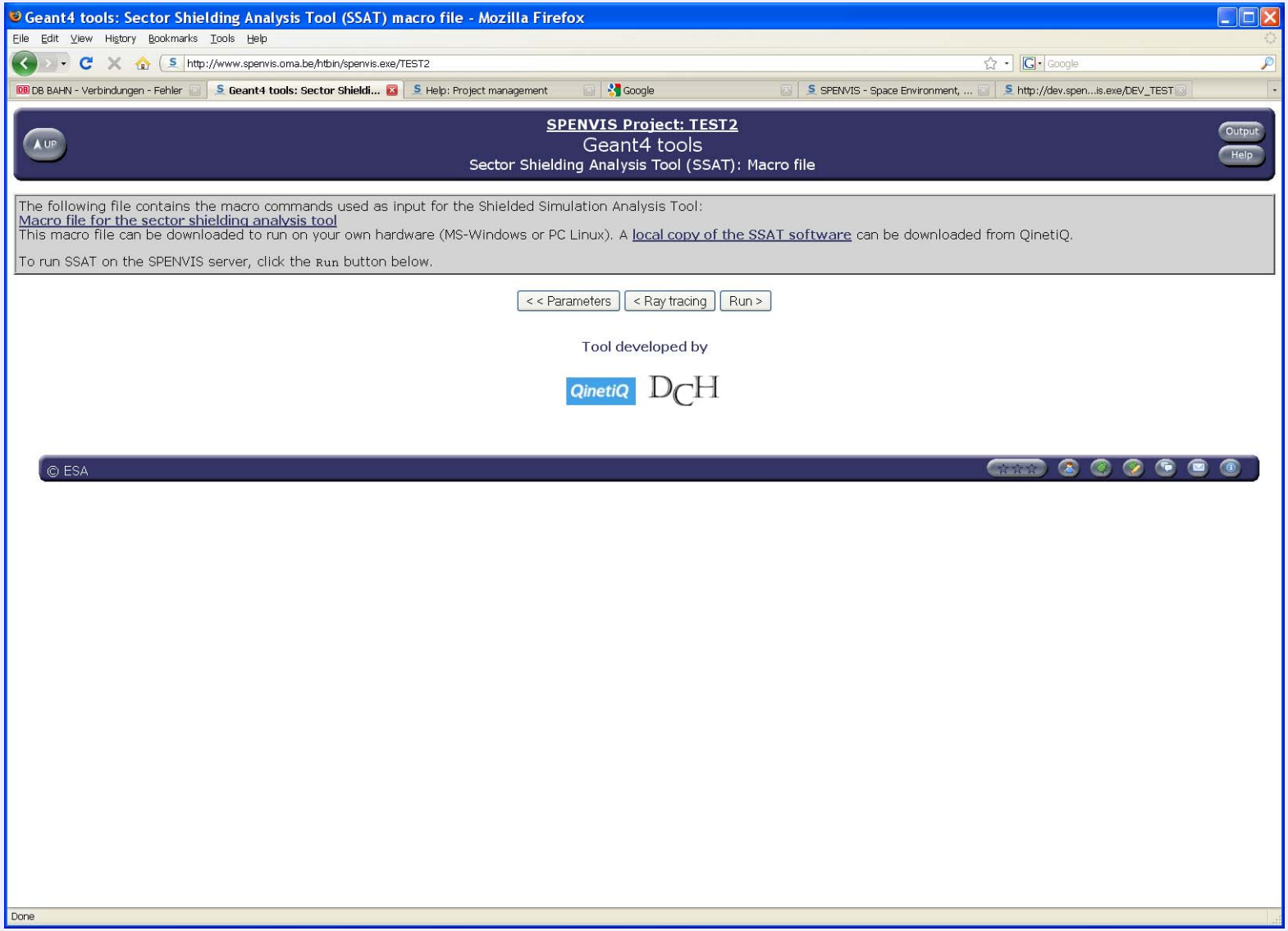
SSAT Example: GDML Import



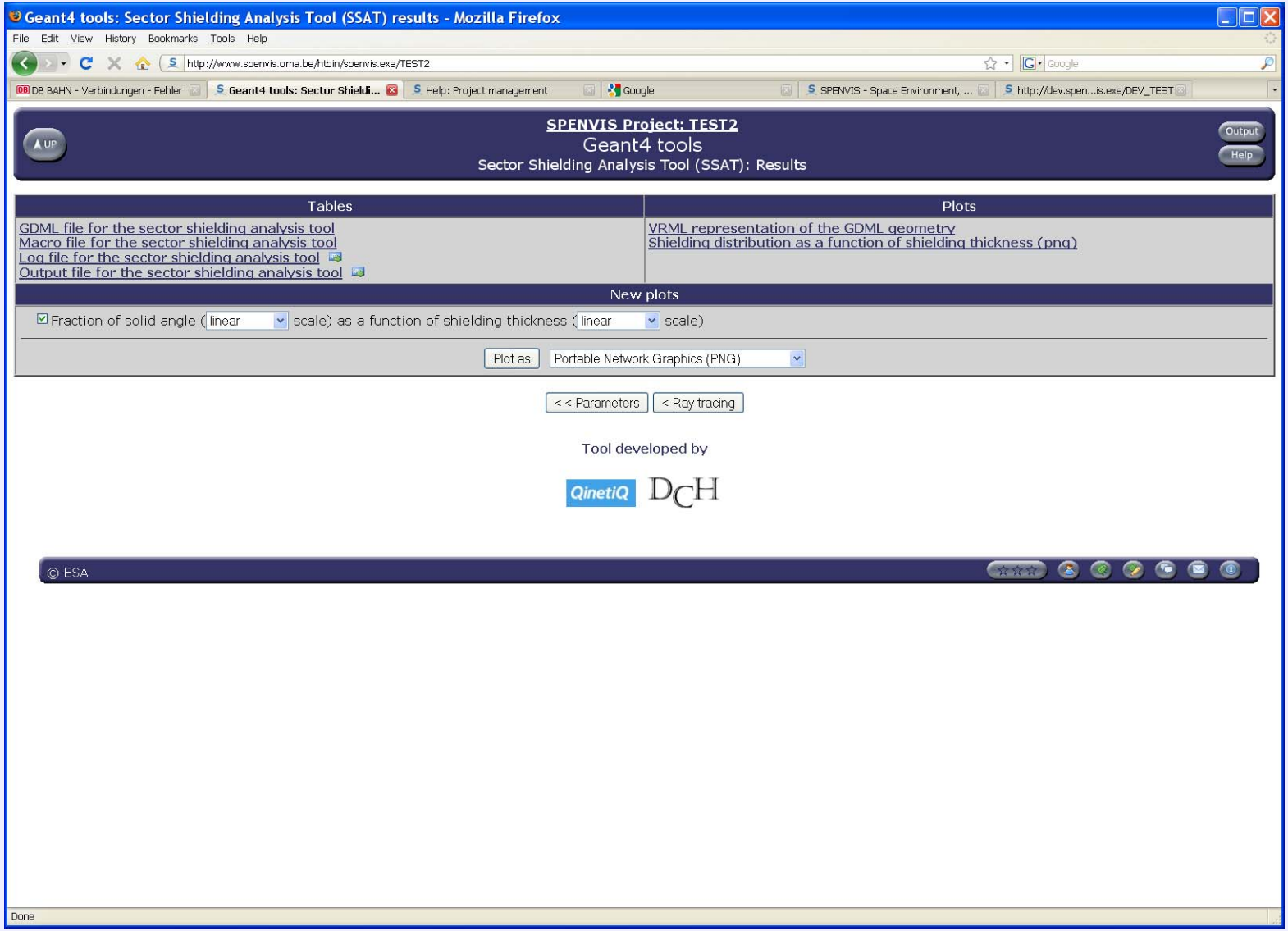
SSAT Example



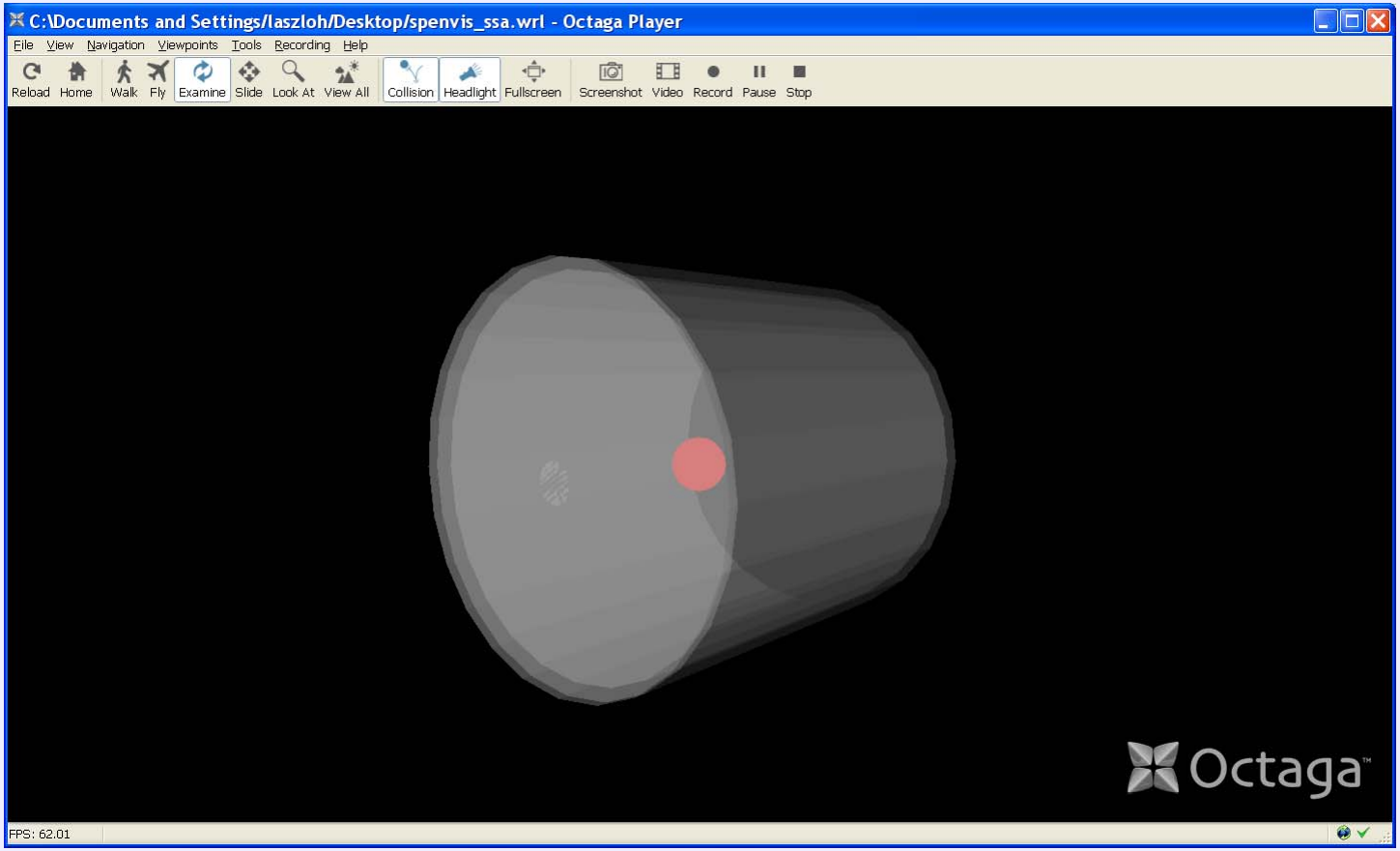
SSAT Example



SSAT Example

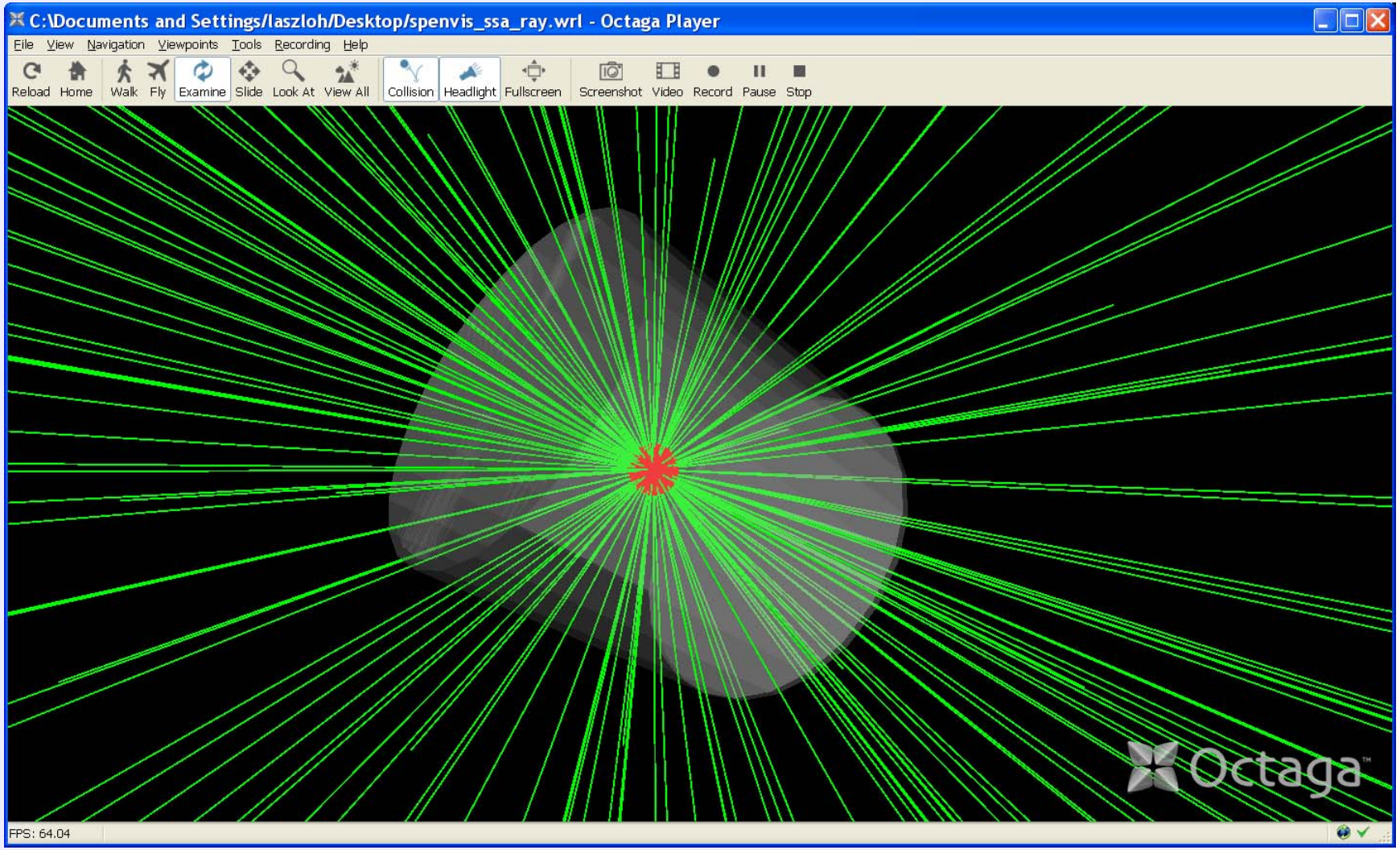


SSAT Example: Analysis Geometry

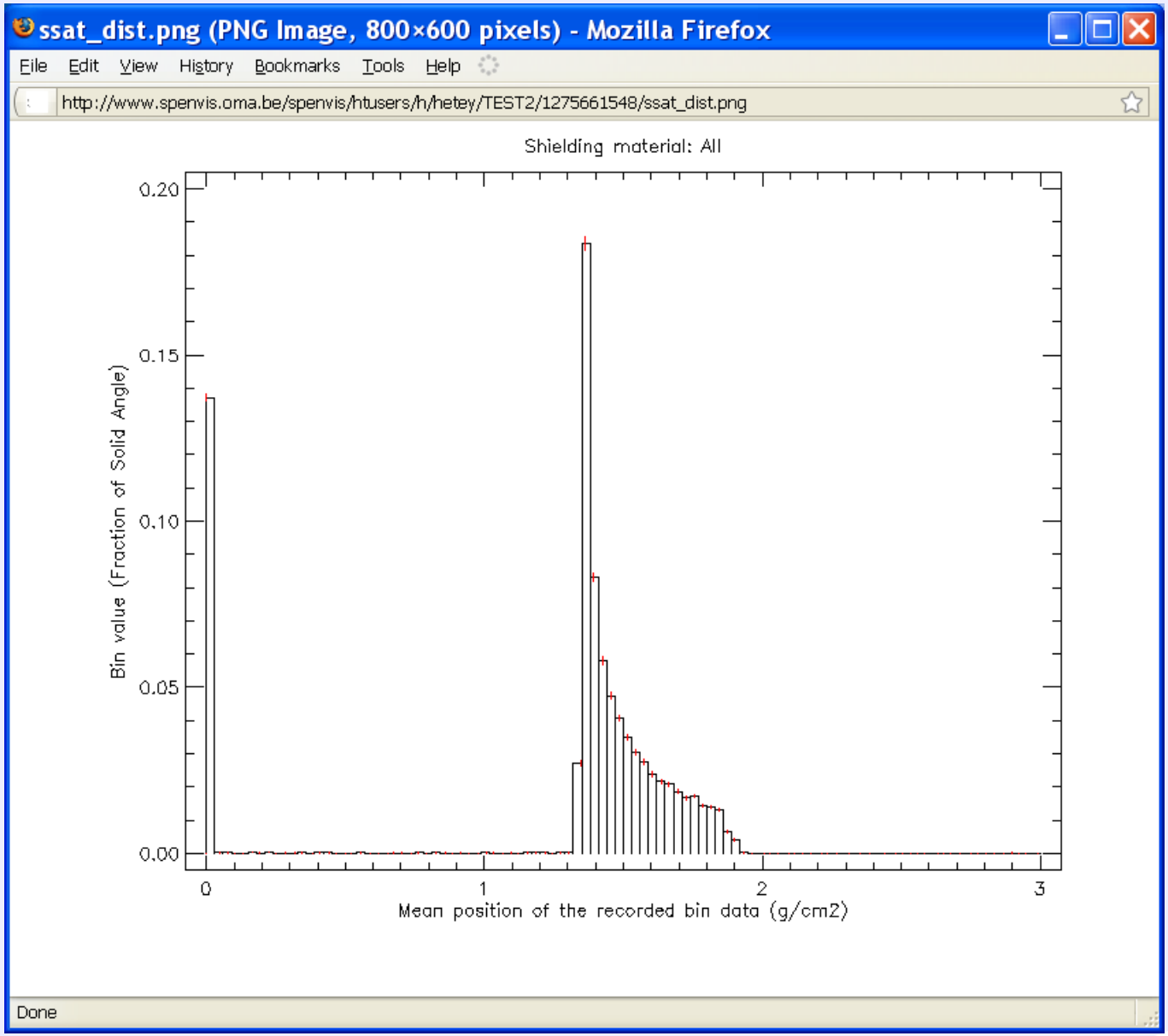


(Octaga-Player: http://www.octaga.com/
free for non-commercial use)

SSAT Example: Result Visualisation



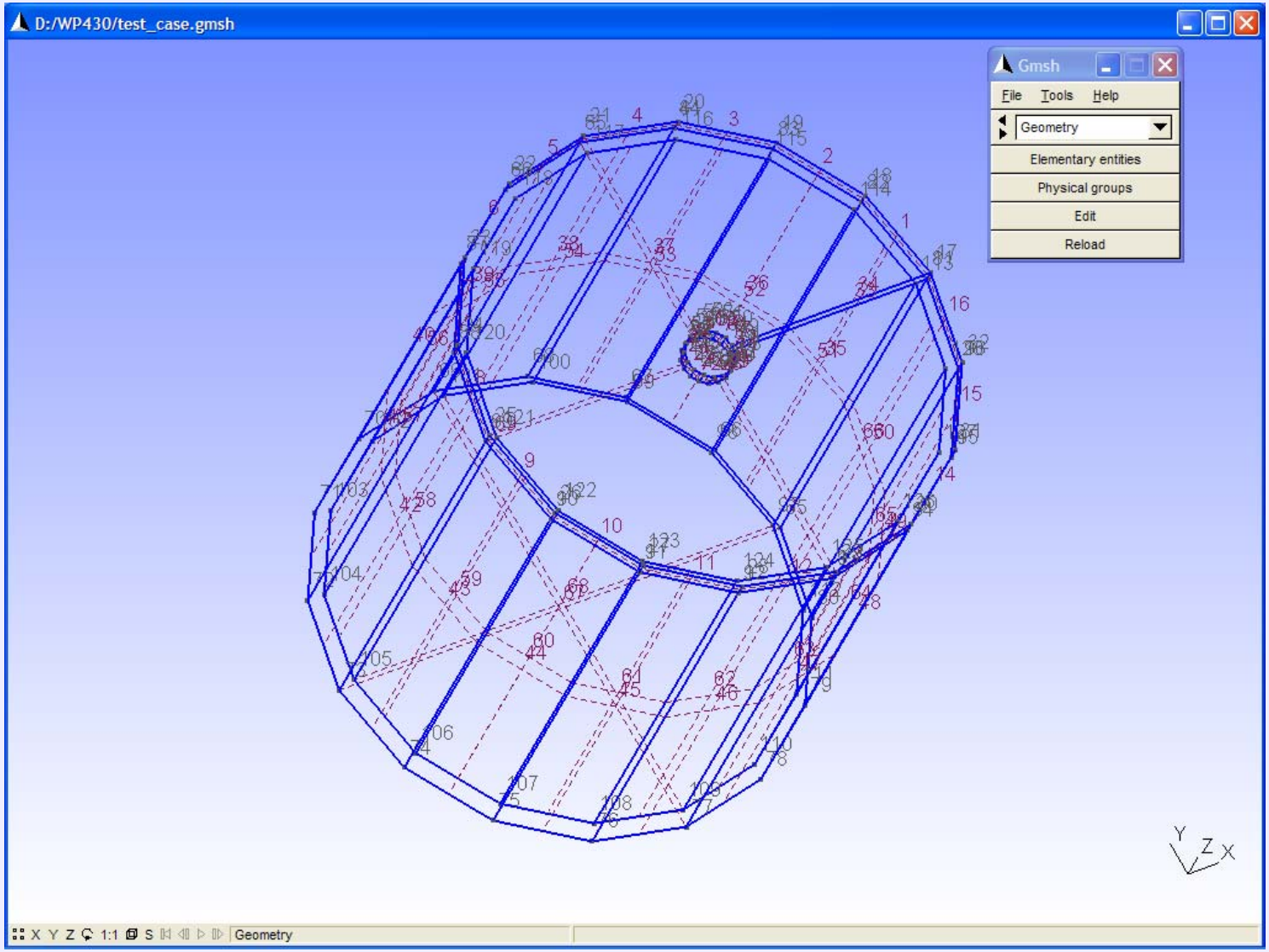
SSAT Example: Shielding Distribution



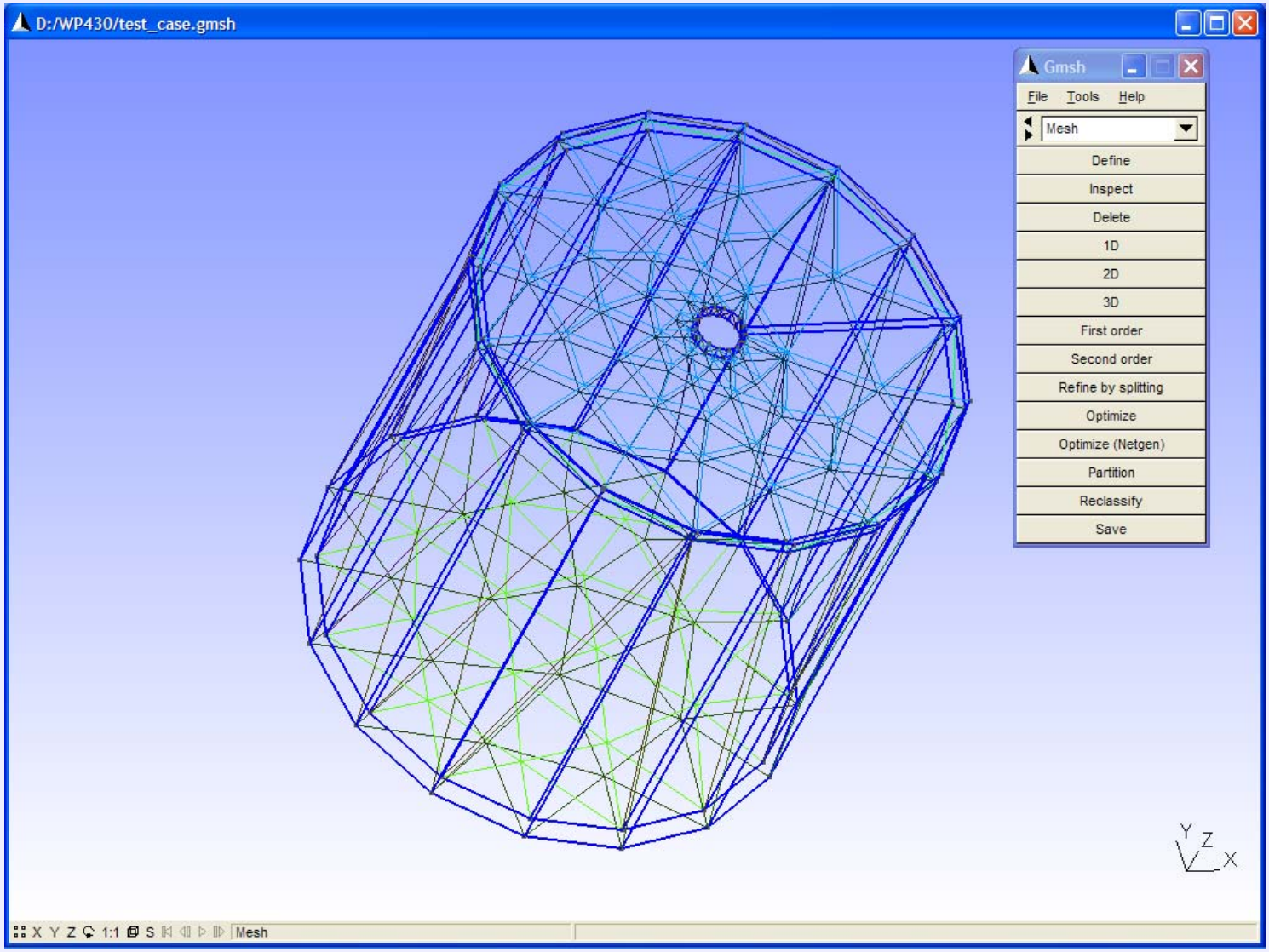
GMSH Format

- **Tool exports geometry in CAD-format**
- **Import to FEM mesh generator GMSH**
  http://www.geuz.org/gmsh/ (free software)
- **GMSH used by SPIS**
- **Can be applied for other CAE tools**

GMSH: Geometry Import



GMSH: Meshing



Thanks for your attention!

Any problem report is welcome!!
This software is new…

Laszlo.Hetey@aeronomie.be