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New specific solids definitions in the Geant4 geometry modeller

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Twisted trapezoids are important components in the LAr end cap calorimeter of the Atlas detector. A similar solid, the so-called twisted tube consists of two end planes, inner and outer hyperboloidal surfaces, and twisted surfaces, and is an indispensable component for cylindrical drift chambers (see K. Hoshina et al, Computer Physics Communications 153 (2003) 373-391). In Geant3 exists a general version of a twisted trapezoid, however the implementation puts very strong restrictions on its use.

In the Geant4 toolkit no solids have been available to date to describe twisted objects. The design and realisation of new twisted solids within the framework of Geant4 will be presented together with the algorithmic details, followed by a discussion of the performance and accuracy test results.

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