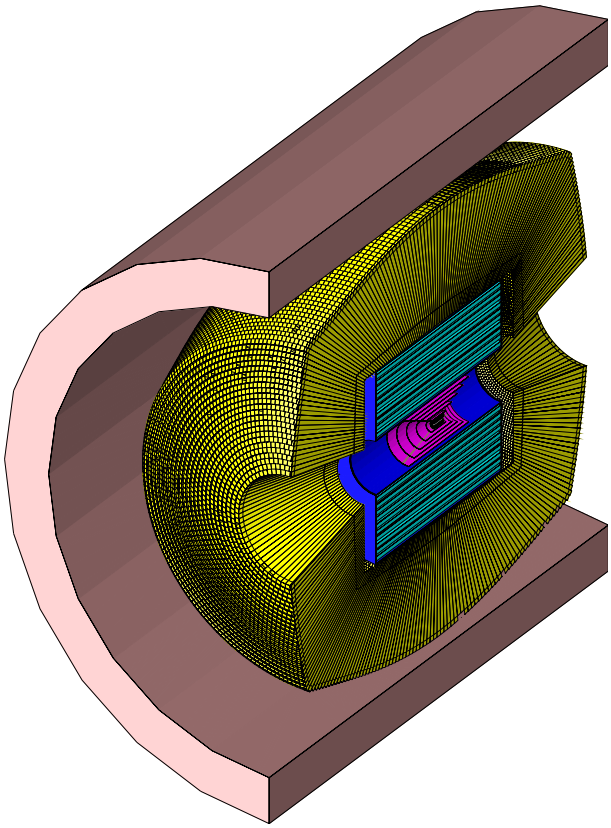

Figure 1: Cut view of the JLC detector as implemented in JUPITER, a Geant4-based full detector simulator.

1 Jupiter: a Geant4-Based Full Detector Simulator

R&D's for the JLC detector have so far been aiming at establishing component technologies. These R&D's can thus be regarded as being in a test-of-principle phase. With most of these R&D's successfully conducted, we are now entering an engineering design phase to clarify technical details for full-scale prototype tests.

Before full-scale prototyping, we need to reconcile the basic detector parameters and reevaluate the performance of the detector system as a whole, with the hardware R&D results for component technologies taken into account. In parallel with the hardware R&D's, we have thus been developing a full detector simulator called JUPITER. JUPITER is based on Geant4 and works with its SATELLITES, both being written in C++ and hence taking full advantage of object-oriented technology. JUPITER provides a unified framework to facilitate implementation of highly hierarchical structures of detector components and allows us to code details such as single pixels of CCD arrays of the vertex detector, individual drift cells and corresponding wires of the central drift chamber, etc. Fig. 1 shows a cut view of the current JLC detector model as implemented in JUPITER. One can see the vertex detector (VTX), the intermediate silicon tracker (IT), the central drift chamber (CDC), the electromagnetic and hadron calorimeters (CAL), and a super-conducting solenoid (SOL) that surrounds them. The full simulator is now being used to study detector performance such as time-stamping capability of the CDC in the presence of stereo layers.