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The GeoModel Toolkit for FCC simulation

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The software description of the ATLAS detector is based on the GeoModel toolkit, developed in-house for the ATLAS experiment but released and maintained as a separate package with few dependencies. A compact SQLite-based exchange format permits the sharing of geometrical information between applications including visualization, clash detection, material inventory, database browsing, and lightweight full G4 simulation. The set of geometrical primitives is based on a scene graph approach. Shared instancing and volume parameterization can be used to achieve a low memory footprint. An interface to the alignment system allows for multithreaded operation, required for situations in which a detector element is considered in concurrent threads during different alignment periods. The geometry tool has been used in ATLAS for over a 20 year period, and recently expanded to a more comprehensive toolkit for geometry development, which is portable, friendly, and easily installed. It is proposed to investigate the use of this toolkit to assemble and operate a simulation of one or more proposed FCC detector systems.

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