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A method for sharing dynamic geometry information in studies on liquid-based detectors

It is usually difficult to describe the non-uniformity of the liquid in a detector because the fixed method is used to construct the geometry in detector simulations such as Geant4. We propose a method based on geometry description markup language and a tessellated detector description to share the detector geometry information between computational fluid dynamics simulation software and detector simulation software. Its feasibility is demonstrated by applying the method to a simulation with a non-uniform medium to study the photon transport and a deviation in the event of a vertex reconstruction.

This method can also be used to study other dynamic geometry-related problems in particle and nuclear physics experiments, such as the expansion and contraction of detector alignment at different running periods of the experiments, and geometry-related changes to the magnetic field. This will also be helpful in the detector design and performance optimization.

Significance

References

Speaker time zone

Compatible with Asia

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