Contribution ID: **132** Type: **Oral Presentation**

Computational Fluid Dynamics in the ATLAS Detector

Tuesday, 5 July 2022 12:00 (15 minutes)

The fluid flow and temperature environment of the planned upgrade of the ATLAS inner Tracker is investigated by computational simulation in order to inform design and assure specifications are met. This is done using Computational Fluid Dynamics. The essence of the this approach is that fluid dynamics equations that would be analytically unsolvable for most cases can be approximated to a high degree of accuracy by dividing the geometry into a mesh of millions of tiny cells and solving the equations for each cell individually. The results of adjacent cells must be made to be physically consistent and the simulation can be iterated until solutions converge to the desired accuracy. From this we get distributions for flow, temperature, humidity and almost any other desired quantity, allowing us to understand the environment within the detector and advise on the positioning of sensors. This presentation describes the fluid dynamics simulations, from the specification of the simplified geometry, identifying the physics processes to be included, and finally to results , which are discussed to assess the validity of the model and its significance for the Inner Tracker design process.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

PhD

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