Contribution ID: **3474** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) AI-Assisted Design of the ECCE Tracking System at the Electron Ion Collider

Tuesday 7 June 2022 16:15 (15 minutes)

The Electron-Ion Collider (EIC) is a future facility, which will be uniquely poised to address questions related to the origin of mass and spin of the nucleon and the emergent properties of dense systems of gluons.

EIC Comprehensive Chromodynamics Experiment (ECCE) will be building the detector for EIC based on a 1.5T solenoidal magnet. During its proposal, ECCE leveraged on Artificial Intelligence (AI) to design the tracking detector subsystem. ECCE was one of the first-large scale experiment to use AI during its design phase.

In this talk, the ECCE tracking system will be presented, as well as the AI-assisted optimization process employed to optimize the dimensions and locations of the inner tracker elements. Details related to Multi-Objective Optimization (MOO) using an AI-based evolutionary algorithm will be shown.

Finally we present the results of the various optimization phases for the tracker in ECCE-EIC.

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Session Classification: T4-6 Physics at the EIC Symposium: Experimental Opportunities at the EIC (DNP) | Symposium sur la physique à l'EIC: opportunités expérimentales à l'EIC (DPN)

Track Classification: Symposia Day (Tues. June 7) / Journée de symposiums (mardi, le 7 juin): Symposia Day (DNP) - Physics at the Electron-Ion Collider (EIC)