Contribution ID: **74** Type: **ORAL**

R&D of the calorimeter in the CEPC experiment

Wednesday, 11 October 2023 14:20 (20 minutes)

The future lepton collider experiments, e.g. the Circular Electron Positron Collider (CEPC), are aimed at the precise measurement of the Standard Model (SM) particles and the exploration of new physics. This imposes stringent requirement on the jet measurement. Therefore, a novel high granularity calorimetry system has been proposed. It contains a homogeneous crystal bar electromagnetic calorimeter (ECAL) designed to achieve an optimal EM energy resolution of $2-3\%/\sqrt{E}$ with a reduced number of readout channels, and a sampling glass-scintillator hadronic calorimeter (HCAL) for better intrinsic hadronic energy resolution by increasing the density, light yield and energy sampling fraction. By combining the tracker measurement in the Particle Flow Approach (PFA), this conceptual detector design is expected to enhance the Boson Mass Resolution (BMR) from 4% in CEPC CDR to 3%. Currently full simulations using Geant4 have been conducted for both ECAL and HCAL to study the energy performance and optimize the design. In terms of hardware development, small-scale crystal ECAL modules and individual glass scintillator tiles have been fabricated and subjected to beam testing at DESY to address critical system-level issues. Furthermore, a dedicated PFA algorithm is being developed to address the challenge of severe shower overlapping and ambiguation issues in the crystal bar ECAL. In this report we will introduce the R&D progress of these crystal ECAL and glass scintillator HCAL for the CEPC, and a very preliminary expectation of their PFA and physics performance.

Primary authors: Mr QI, Baohua (IHEP, CAS); Ms DU, Dejing (IHEP, CAS); Dr GUO, Fangyi (Institute of High Energy Physics, CAS); Prof. LIU, Yong (IHEP, CAS)

Presenter: Dr GUO, Fangyi (Institute of High Energy Physics, CAS)

Session Classification: Parallel - WG3