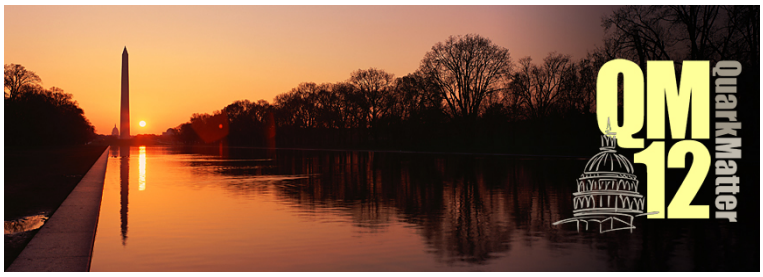

Contribution ID: **597** Type: **Poster**

Performance simulations of a super compact forward electromagnetic calorimeter

Thursday, August 16, 2012 4:00 PM (2 hours)

We present a performance study of a compact electromagnetic calorimeter meant to serve in a forward region (2 < eta < 4.5) in collider experiments in pp, pA and AA collisions. This kinematic region at LHC energies allows one to study very low Bjorken x physics. Measurement of direct photons in this region enables one to improve the precision of (nuclear) parton distribution functions.
Our design is a scintillator-tungsten calorimeter with optical readout aimed at measuring high energy (1 < E < 1000 GeV) photons. We study its performance with Geant model. We present the design spatial energy resolution. Main contaminant of the photon yield in this kinematic domain are the secondary photons from pi0 decays, which account for more than half of the inclusive photon yield. We present pi0 rejection efficiency using cluster shape and depth energy deposition. Such device allows study of other effects in this kinematic region, such as jet measurement and jet quenching in the nuclear medium in pA and AA collisions and suppression driven by the coherence effects.

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Session Classification: Poster Session Reception

Track Classification: Experiment upgrades, new facilities, and instrumentation