

## Search for elliptic azimuthal anisotropies in photon-proton and pomeron-Pb interactions with ultraperipheral pPb collisions with the CMS experiment

For several years there has been a strong interest in measuring collective effects in small systems such as proton-proton (pp) and proton-lead (pPb). Such measurements give new insights into the nature of QCD and the meaning of collectivity. In the recent years ALEPH, ATLAS, and ZEUS collaborations have extended these studies to electromagnetic interactions such as electron-positron (ee), photon-lead ( $\gamma$ Pb), and electron-proton (ep) systems, respectively. No evidence of collectivity as in pp or pPb (for the same degree of collectivity) was found, placing a bound on the multiplicity range of long-range collectivity. The CMS Collaboration further extends the measurements into photon-proton ( $\gamma$ p) and pomeron-lead ( $\mathbb{P}$ Pb) interactions using ultraperipheral pPb collisions at 8.16 TeV. Such interactions provide unique initial conditions with event multiplicity lower than in pp and pPb systems but comparable with ee and ep systems, whereas, and in contrast to the other systems,  $\mathbb{P}$ Pb is a pure QCD interaction. This talk will summarize the first measurements of long-range particle correlations in  $\gamma$ p and  $\mathbb{P}$ Pb systems.

### Submitted on behalf of a Collaboration?

Yes

**Author:** CMS COLLABORATION

**Presenter:** CMS COLLABORATION

**Session Classification:** WG2: Small-x, Diffraction and Vector Mesons

**Track Classification:** WG2: Small-x, Diffraction and Vector Mesons