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Simulating the Response of the High-Intensity Luminosity Monitor at the LHC SAMUEL HEDGES¹, HOWARD MATIS, ALESSANDRO RATTI, MASSIMO PLACIDI, WILLIAM TURNER, LBNL, LARP COLLABORATION, NERSC COLLABORATION — To achieve the recent discovery of a Higgs-like object at the LHC, the machine operators needed detectors to optimize the number of collisions in the machine. One of these detectors is called the Beam Rate of Neutrals (BRAN). The BRAN is a gas ionization chamber detector developed at LBNL and used to measure relative luminosity of collisions on both sides of the ATLAS and CMS interaction regions. We have used the Monte Carlo simulation software FLUKA to simulate the detector's response to p-p, p-Pb, and Pb-Pb collisions at both current and future colliding conditions. In this talk, we will describe the detector and the results from the simulations. The simulations can be used to explain differences between the energy deposited in the BRAN at ATLAS and CMS. We will compare these measurements to data taken with the detector.

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