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**Vernier Scan Analysis for PHENIX Run 15 p+p Collisions,  $\sqrt{s} = 200$  GeV** GREGORY OTTINO, University of New Mexico, PHENIX COLLABORATION — In high energy nuclear physics, cross-section measurements are critical to form an understanding of particle production and they require a characterization of absolute integrated luminosity. The technique used by the PHENIX experiment for luminosity calculations is the Vernier Scan or Van Der Meer Scan. The scan consists of sweeping one beam across the other in the vertical and radial directions in the transverse plane, and then fitting the data of event rate vs. position to a 2D Gaussian distribution. The fit is analyzed to extract the overlap profile of the colliding bunches. The extracted widths, along with the number of protons, are used to calculate the luminosity,  $\mathcal{L}$ . This, in turn, is used to calculate the p+p cross-section available to the minimum bias trigger,  $\sigma_{BBC}$ . Further analyses provide various correction factors that refine the measurements of rates and positions, improving the initial calculations of  $\mathcal{L}$ . Final corrected measurement of  $\sigma_{BBC}$  is used to calculate integrated luminosity in any of the cross-section measurements with the relevant PHENIX data set. The current data set to be analyzed is from PHENIX Run 15 p+p collisions at  $\sqrt{s} = 200$  GeV.

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