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Luminosity determination in pp and Pb-Pb collisions at the LHC with the ALICE detector

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Luminosity is an essential ingredient for the measurement of the cross section of physical processes. Luminosity determination in ALICE at the LHC is based on the visible cross sections measured in dedicated calibration experiments (van der Meer scans).

Besides serving as reference for the determination of integrated luminosities, the cross sections measured in van der Meer scans can, with suitable extrapolation, provide direct access to physical quantities such as the inelastic interaction cross section.

Van der Meer scans have been performed at the LHC in pp collisions at $\sqrt{s} = 2.76, 7$ and 8 TeV and in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV. A detailed description of the ALICE setup and analysis will be given; the measurement uncertainties will be discussed and compared to the requirements of the ALICE physics program.

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