

Beam Bas Vertexing detector.

The Beam Gas Vertex (BGV) detector is foreseen as a non-invasive beam size measurement instrument for the LHC and its luminosity upgrade. This technique is based on the reconstruction of beam-gas interaction vertices, where the charged particles produced in inelastic beam-gas interactions are measured with high precision tracking detectors based on scintillating fibers read out by silicon photomultipliers. The goal of the detector is to perform transverse beam profile measurements capable of providing the width measurements of each bunch with a $\sim 5\%$ accuracy and of the whole beam with a $\sim 2\%$ accuracy in about 1 minute. These target accuracies and measurement durations would allow meaningful measurements to be performed along the LHC energy ramp and a direct calibration comparison to be made with other beam profile monitors. Combined with an independent determination of the β functions of the magnetic lattice, the BGV measurements will be used to provide precise values of the beam emittance (per bunch, or averaged over all bunches of one beam) throughout the LHC cycle.