



Contribution ID: 107

Type: Poster

## Upgraded Fast Beam Conditions Monitor for CMS online luminosity measurement

The CMS beam and radiation monitoring subsystem BCM1F during LHC Run I consisted of 8 individual diamond sensors situated around the beam pipe within the tracker detector volume, for the purpose of fast monitoring of beam background and collision products. Effort is ongoing to develop the use of BCM1F as an online bunch-by-bunch luminosity monitor. BCM1F will be running whenever there is beam in LHC, and its data acquisition is independent from the data acquisition of the CMS detector, hence it delivers luminosity even when CMS is not taking data. To prepare for the expected increase in the LHC luminosity and the change from 50 ns to 25 ns bunch separation, several changes to the system are required, including a higher number of sensors and upgraded electronics. In particular, a new real-time digitizer with large memory was developed and is being integrated into a multi-subsystem framework for luminosity measurement. Current results from Run II preparation will be shown, including results from the January 2014 test beam.

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**Track Classification:** Experiments: 2a) Experiments & Upgrades