

The Radiation Background without the Forward Shielding.

A set of simulations have been made by Mike Shupe using the GCALOR program with the purpose of estimating the background in the muon spectrometer during 450 GeV running without the forward shielding. The basic assumptions were a luminosity of $10^{34} \text{ cm}^{-2}\text{s}^{-1}$ and that one LHC year consists of 10^7 s. Simulations were made both at 7 TeV and 450 GeV. The conclusion is that ATLAS can run up to a luminosity of almost $10^{32} \text{ cm}^{-2}\text{s}^{-1}$ at 450 GeV and still have background rates below those estimated with the shielding for $10^{34} \text{ cm}^{-2}\text{s}^{-1}$ at 7 TeV. The results are given in the table below and in the following set of figures. A detailed description of the program and the assumptions used in the calculation can be found in the ATLAS note ATL-GEN-2005-001.

Big Wheel: z =14 m, r = 2 m

	With JF (7 TeV)	No JF (7 TeV)	Ratio	No JF (450 GeV)	Ratio
All neutrons (kHz/cm ²)	8	1500	190	350	45
Neutrons > 100 keV (kHz/cm ²)	1.5	500	340	160	110
Photons (kHz/cm ²)	20	3500	180	600	30
Hadrons > 20 MeV (/cm ² /year)	2x10 ⁹	4x10 ¹¹	200	1x10 ¹¹	50

Barrel: z =9 m, r = 9 m

	With JF (7 TeV)	No JF (7 TeV)	Ratio	No JF (450 GeV)	Ratio
All neutrons (kHz/cm ²)	7	80	10	10	1.5
Neutrons > 100 keV (kHz/cm ²)	1.3	10	8	3.0	2.3
Photons (kHz/cm ²)	2.0	100	50	20	10
Hadrons > 20 MeV (/cm ² /year)	4x10 ⁹	4x10 ¹⁰	100	5x10 ⁹	1.3

















