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## Study of di-photon events in the ATLAS detector at the LHC : cross-section measurement and application to Higgs searches in the di-photon channel

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The measurement of the isolated di-photon cross-section at the LHC is crucial as these events constitute an irreducible background to new physics processes, such as a Higgs boson or graviton decaying to two photons. These events also provide important information for the understanding of QCD processes. The di-photon cross-section has been measured in ATLAS using the full 2010 data sample, corresponding to an integrated luminosity of 37 pb<sup>-1</sup>. Results as a function of the di-photon invariant mass, transverse momentum and azimuthal separation are presented and compared with NLO theoretical predictions. Focusing on the invariant mass region between 100 and 150 GeV where a light Higgs boson is searched for in the di-photon channel, exclusion limits are set on the Standard Model prediction. The results obtained are already at the level of the results from TeVatron experiments in this channel.

**Level (Hons, MSc, <br> &nbsp; PhD, other)?**

PhD

**Consider for a student <br> &nbsp; award (Yes / No)?**

No

**Would you like to <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?**

Yes

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