UNIVERSITÉ
DE GENÈVE
FACULTÉ DES SCIENCES
Département de physique
nucléaire et corpusculaire

SÉMINAIRE DE PHYSIQUE CORPUSCULAIRE

SUJET: **First direct measurement of light-by-light scattering**

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DATE: Mercredi 14 novembre 2018

LIEU: Ecole de physique, Grand Auditoire A - **11h15**
24, Quai Ernest-Ansermet, Genève

RÉSUMÉ:

Light-by-light scattering is a process in which two photons interact with each other and in consequence change a direction of their motion. This phenomenon is forbidden in the classical physics. Only after the birth of quantum electrodynamics in the 30th of the XX century, Heisenberg and his student Euler realized that two photons may interact with each other. Unfortunately for decades that process has stayed elusive for direct measurements due to its tiny cross section. A breakthrough has occurred in 2017 when the ATLAS Collaboration at the LHC analysed data from lead-lead collisions collected at the center-of-mass energy of 5.02 TeV. A focus was given to a special class of events, so-called ultra-peripheral collisions (UPC), in which two lead nuclei do not collide but pass next to each other. UPC events are considered a source of high-intensity electromagnetic fields, thus photons. In 4 billion analysed events, the ATLAS Collaboration found 13 event candidates with scattered photons, while about 2 were expected from background processes. This measurement established evidence for a first direct measurement of light-by-light scattering. In October 2018 also a result of light-by-light scattering from the CMS Collaboration was released. This talk will discuss the analysis, results of the measurements, and also prospects for future analyses of lead-lead data including the ongoing 2018 run.

INFORMATION : http://www.unige.ch/dpnc
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