## Dark matter searches in LUX

Monday 28 November 2016 14:00 (20 minutes)

The Large Underground Xenon (LUX) is a dark matter experiment searching for direct evidence of Weakly Interacting Massive

Particles (WIMPs), a favored dark matter candidate. It is a 250 kg active mass dual-phase xenon time projection chamber operating at the Sanford Underground Research Facility in USA. The results from the second and final science run with a total of 332 live days of exposure revealed no evidence of WIMP nuclear recoils with a four-fold improvement

in sensitivity for high WIMP masses relative to our previous results. Currently, LUX has the world leading exclusion limit in a wide range of WIMP masses. At a WIMP mass of 50 GeV c-2, WIMP-nucleon spin-independent cross sections above 0.22 zepto barns are excluded at 90%.

The interpretation of any potential WIMP signal requires to understand very well the response of the detector to both electronic and nuclear recoils thus requiring the LUX detector to be calibrated thoroughly during the second science run.  $^{83m}$ Kr was injected weakly, CH<sub>3</sub>T, injected 2-3 times per year, used to define our elecronic recoil band and a collimated beam of monoenergetic 2.45 MeV neutrons used to define our nuclear recoil band. These calibrations were also essential to study the uniformity of the electric field, to define the active region volume and to correct the signal dependence with the position of interaction.

The LUX detector is also able to explore other alternative Dark Matter scenarios, such as axion like particles (ALPs) or look for other type of signals such as annual modulation signals or solar axions. An update of some of those searches will be presented as well.

## Summary

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Author: PASCOAL DA SILVA, Claudio Frederico (LIP Coimbra)

Presenter: PASCOAL DA SILVA, Claudio Frederico (LIP Coimbra)

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