

## Latest results from the superfluid-helium UCNs source SUN2 at ILL

*Tuesday, 10 September 2013 17:00 (15 minutes)*

A current research and development program at the ILL has the goal to bring production of ultracold neutrons (UCN) in superfluid helium to maturity for applications in experiments at room temperature. While experiments with a first prototype had resulted in a UCN density of 55 per ccm, significant progress was made with an improved, second apparatus.

SUN2 is composed of a 4 liters UCNs converter, full of He4, isotopically pure, cool down with a He3 evaporation refrigerator. The UCNs converter is traversed by monochromatic neutrons provided at a new, dedicated beam line. Thanks to a modular setup, a short cooldown time and a converter preparation of only two days, a series of experiments on UCN production, accumulation and determination of characteristic time constants could be performed in several converter vessels. Tested configurations include supermirrors on aluminium and glass substrates used to guide the cold beam, with a top layer of beryllium, Ni/Mo or fluorinated grease for UCNs reflection. In particular, this talk will report new results on achieved UCN densities.

**Primary authors:** Mr ROSENAU, Felix (ILL); Dr MARTIN, Florian (Institut Laue Langevin); Dr SIMSON, Martin (Institut Laue-Langevin); Dr ZIMMER, Oliver (ILL); Dr IVANOV, Serguei (ILL)

**Presenter:** Dr MARTIN, Florian (Institut Laue Langevin)

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