

## Angelique Larteaux - Beating the Standard Quantum Limit for the gravitational wave detector Advanced Virgo.

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# Beating the Standard Quantum Limit for the gravitational wave detector Advanced Virgo.

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In the context of the improvement of the Advanced Virgo gravitational wave detector, the quantum noise contribution to the detector noise has to be reduced in order to increase its sensitivity and consequently the observable volume of the Universe.

One of the idea to go beyond the Standard Quantum Limit is to use frequency dependent squeezed states of light. The implementation of this technique is tested on the CALVA experiment at IJCLab in the framework of the Exsqueez ANR in collaboration with LKB, IP2I and LAPP.

In this presentation, I will give the basis of gravitational wave detection, quantum noise and squeezing to present the design of the experiment done at IJCLab followed by the characterization results of the first optical systems used to produce and measure frequency independent squeezing, a first step for the obtention of frequency dependent squeezing.

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