

Benjamin Pointard - Optically-Based Microwave: Frequency Comb Bootstrapping and other Comb Activities

ID de Contribution: 1

Type: **Non spécifié**

Optically-Based Microwave: Frequency Comb Bootstrapping and other Comb Activities

jeudi 27 avril 2023 11:00 (1h 30m)

ABSTRACT

Reaching quantum projection noise in atomic fountains requires a low-noise ultra-stable microwave signal. The division of a high-stability optical signal in to the microwave domain by an optical frequency comb has been proven to vastly exceed the performance of any other established technology. I present our new scheme to generate a hybrid microwave, featuring both the excellent short-term frequency stability of an optical cavity and the long-term phase predictability of an H-maser. Preliminary stabilities against microwave fountains confirm its capacity to replace our 11.98 GHz cryogenic oscillator. Moreover, the referencing of an optical clock transported outside the laboratory is a requirement to ensure the accuracy of the measurements. I present two combinations of techniques, the bootstrapping of an OFC and the exploitation of an accurate 1542 nm reference or the exploitation of a laser reference on the atomic transition of the clock, in order to generate locally an accurate RF signal, even in an environment away from a metrology laboratory.

Orateur: Dr POINTARD, Benjamin (LNE-SYRTE)