RAP Seminar

Special Talk

Language: English

Date & Time: April 28 (Tue) 15:00 -17:00, 2026

Cooperation Center W426, Wako Campus, RIKEN

Title: Advances in Frequency Metrology with Optical Frequency Combs

Speaker: Michele Giunta, Ph.D.

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Abstract

Optical frequency combs (OFCs) are among the most precise active measurement devices ever developed. More than 25 years after their first demonstrations, they have become universal tools in AMO physics, precision spectroscopy, astronomy, and are essential for realizing optical clocks by enabling direct counting of the rapid cycles of optical frequency standards. In this work, we review activities culminating in optical frequency measurements with relative accuracies at the 20th decimal digit, and optical frequency division to the microwave domain with fractional instabilities at the 1×10^{-17} level at 1 s and down to the 10^{-20} level for averaging times beyond 10^4 s. We will provide an overview of the ongoing efforts dedicated to bring these precision metrology instrumentations out in the field, and for their integration in more complex systems enabling a variety of applications.

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