INRiM Seminar

Ultrastable lasers for optical frequency metrology at NPL

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Abstract

Ultrastable lasers play a key role in setting the measurement speed and precision of optical clocks, greatly facilitating clock accuracy characterisation. With the aim of supporting the optical clocks in reaching the targets of the roadmap for the redefinition of the SI second, at NPL we have been focusing on the development of ultrastable lasers with state-of-the-art stability performance, continuous operation, simplicity of use and construction, and no maintenance. For the above reasons, we have realised ultrastable lasers based on 0.5 m long optical reference cavities, operating at room temperature and with ultra-low estimated thermal noise. The seminar will describe the technology to achieve ultrastable lasers' continuous operation at frequency instability below 6E-17 and linear drift below 20 mHz/s. We will discuss present limitations and strategies to overcome them, with emphasis on reducing the impact of seismic noise and on extending state-of-the-art stability to longer averaging times.

Date: 28/05/2026 **At: 10:30**

Conference Room, M Building – -1 Floor

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