

Channeling 2018



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Free Electron Laser and CARM Devices: A Unified Point of View

Tuesday, 25 September 2018 16:50 (30 minutes)

Review of undulator based Free Electron laser (U-FEL) theory
Review of CARM (Coherent Auto Resonance Maser) theory
Analysis of analogies and differences
Development of a common theoretical framework
Presentation of the ENEA Frascati CARM experiment

Summary

We review the founding principles of U-FEL and CARM devices.
The possibility of retrieving a common point of view is foreseen and the relevant consequences are drawn.
We exploit the wealth of scaling relations developed for U-FEL to develop a CARM design tool, either for the amplification and oscillator configurations.
We finally discuss the ENEA CARM project, namely the development of a powerful coherent source at 250 GHz, and the relevant possible applications from additional plasma heating to fundamental physics.

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