



Contribution ID: 416

Type: **Oral Presentation**

Computation of Amplified Spontaneous Emission in multi-element laser models

Friday, 13 July 2012 11:00 (20 minutes)

Abstract content
 (Max 300 words)

Amplified Spontaneous Emission (ASE) negatively affects the performance of some oscillators or amplifiers. Some laser models use numerical multi-element approaches. This approach complicates the computation of the ASE significantly.

The three dimensional discrete Radon transform is proposed as a numerical method to compute the integral which describes the ASE radiation. The simulation shows that the use of discrete Radon transform algorithm(s) reduces the computational cost of the ASE integral in some cases. Other properties such as invertibility and geometric accuracy of the Radon transform are investigated.

Simulation of the ASE output of an end pumped Ho:YLF gain medium was performed using both a direct integration and the Radon transform method. The results of the simulation show the saturation behaviour and the wavelength dependence on geometry of the system.

Apply to be
 consider for a student
 award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
 PhD)?

MSc

Main supervisor (name and email)
and his / her institution

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Would you like to
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Yes

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Session Classification: Photonics

Track Classification: Track C - Photonics