Book of Abstracts

22nd International Free Electron Laser Conference
and 7th FEL Users Workshop

13 to 18 August 2000 — Durham, North Carolina USA

Welcome

On behalf of everyone involved in the organization of this conference, we would like to welcome you to Durham, North Carolina and Duke University for the 22^{nd} International Free Electron Laser Conference and the 7^{th} FEL Users Workshop.

We would like to thank the members of both the Conference and Workshop Program Committees and all of the Session Chairs. This year's program promises to present exciting new research in the field of Free Electron Lasers including ground breaking applications of the FEL.

Thanks also goes to the members of the Local Organizing Committee, the International Executive Committee and to everyone else involved.

Vladimir Litvinenko	Ying Wu	Michelle Shinn
Conference Chair	Program Committee Chair	User Workshop Chair

We would like to thank the following sponsors for their generous support:

Duke University

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15.10 Zero slippage operation of TEUFEL.

(TU-4-10)

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The Free Electron Laser in Twente TEUFEL is very suitable to operate near zero slippage conditions. The resonator is a waveguide structure with hole coupling for the electron beam to enter and exit and to out-couple the light. Due to the long wavelength, the diameter of the waveguide can have macroscopic dimensions to significantly affect the group velocity of the generated light via the dispersion relation. Whereas the longitudinal phase-velocity has to be equal to the longitudinal velocity of the electrons to be at resonance, the longitudinal group velocity has to be equal the longitudinal velocity of the electrons too, to operate in the zero-slippage regime. Both conditions can be fulfilled in a waveguide. Advantage of operation in the zero-slippage regime is to allow short pulse operation at high gain. The energy density of the light travels with the electron pulse. For our FEL we expect operation with the following parameters: Electron energy 4 MeV; diameter of circular waveguide 3.2 mm; generated wavelength 658 mm; pulse duration 25 ps. Due to the high quality beam, i.e. high current and low emittance we expect high gain.

[1]This work is sponsored by STW