

# Performance Limitations on Short Wavelength FELs

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A discussion is presented of requirements on the electron beam necessary to achieve high gain at short wavelengths. The performance achieved with photocathode RF electron guns is reviewed. Preservation of emittance in beam transport and magnetic bunch compression is briefly considered, as are the effects of wiggler errors. The results of some SASE experiments in the infrared recently carried out at UCLA/LANL and BNL are summarized, and the need for a coordinated program of R&D toward short wavelength FELs is outlined.