

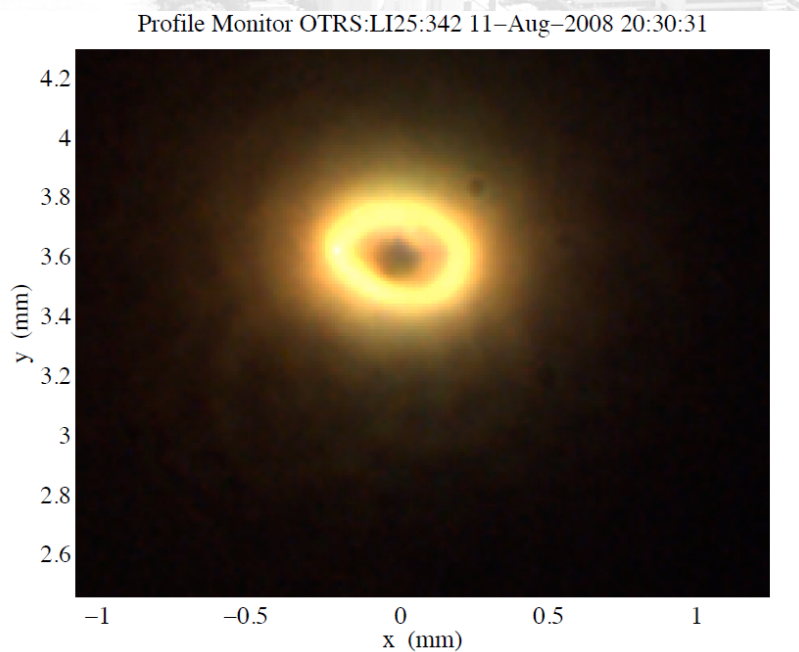
GFA and SwissFEL Accelerator Seminar

Microbunching Instability from Shot Noise in a Linac

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The Microbunching Instability (MBI) was predicted as a potential problem for the high brightness electron beams of Free Electron Lasers (FELs). During commissioning, the Linac Coherent Light Source (LCLS) observed intense coherent optical radiation that appeared to result from MBI. Beyond the academic interest of a new collective effect, the coherent radiation incapacitates the LCLS optical diagnostics and degrades FEL performance. I will briefly review the evidence for MBI at LCLS, and will present a 6D model of MBI driven by shot noise. Intriguingly, the mechanism behind the MBI can, in certain regimes, suppress bunching below the shot noise level. I will end with an analytical model of this shot noise suppression.