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Post-processing of emittance optimization measurements at PITZ

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The Photo Injector Test facility at DESY in Zeuthen (PITZ) is a dedicated test stand for research and development of RF photo-injectors and, in addition, is used to condition and characterize L-band electron guns for European XFEL and FLASH. Recently, a series of measurements were taken at PITZ to optimize the transverse emittance by varying the photo-laser spot size and the gun solenoid strength. These measurements were taken at 18 MeV/c using a single slit scan and imaging the beamlets on a YAG screen. The measured data was later further analyzed to correct for systematic errors including the slit width and imaging resolution when calculating the emittance. This further processing significantly altered the measured emittance trends and changes the required laser spot size and solenoid strength to minimize the emittance. In addition, the x and y slit scan measurements were combined using the Virtual Pepper Pot method to reconstruct the 4D phase space. This revealed significant, asymmetric x-y coupling in the beam. The cause of the coupling is still under investigation.

Speed talk:

Normal speed talk selection

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