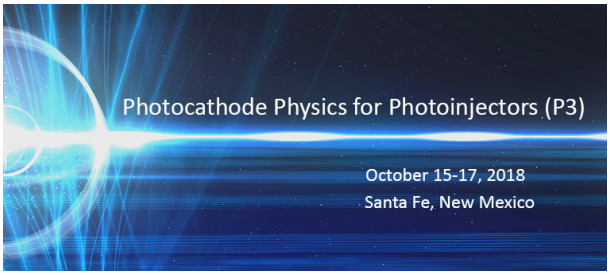

Contribution ID: **40** Type: **not specified**

Space-charge dominated photoemission in the photocathode RF gun at PITZ

Tuesday 16 October 2018 14:00 (15 minutes)

The Photo Injector Test facility at DESY in Zeuthen (PITZ) was built to develop and optimize high brightness electron sources for short wavelength, SC linac driven free electron lasers like FLASH and the European XFEL. High quantum-efficiency Cs2Te photocathodes are driven by a UV laser to produce up to 5 nC charge per single electron bunch in the PITZ gun. Experimental characterization of the Cs2Te photocathodes and the photoemission processes in the gun taking into accounts multiple machine parameters delivers a standard working point in the space-charge dominated regime. Operating the facility at the obtained working point renders an optimized transverse normalized emittance of a 1 nC electron bunch at the injector exit for the European XFEL. The talk will give an overview about the PITZ facility and the experimental and numerical studies of space-charge dominated photoemission using Cs2Te photocathodes. In addition, an experimental observation of microseconds-order spiky intra electron bunch train photoemission from a fresh Cs2Te photocathode at FLASH will be shown and corresponding analysis at PITZ will be presented.

Presenter: Dr CHEN, Ye (DESY)

Session Classification: Session 7

Track Classification: Session 7: Operations and Demonstrations: Normal conducting