

# Characterization and optimization of ultraviolet trigger pulses for a femtosecond RF photogun

A miniature radio frequency (RF) pulsed photoelectron gun capable of producing high energy (180 kV) femtosecond electron pulses at a diffraction target has been built at FS-CFEL-2. A unique advantage of this RF gun concept is the self-compressing nature of the emitted electron bunches, allowing for very short electron pulse durations even at high pulse charge. In order to achieve optimal electron bunch parameters, the ultraviolet (UV) trigger pulses at the photocathode must be shaped appropriately in space and time, requiring the development of appropriate UV pulse characterization devices. This project entails building and testing a UV cross correlator as well as optimizing our existing UV spatial profilometer, eventually demonstrating the generation of truncated Gaussian beam profiles in both space and time. Depending on progress, there is also scope for studying generated electron bunch profiles as a function of UV trigger input.

## Field

A5: Lasers and optics (methodology oriented)

## DESY Place

Hamburg

## DESY Division

FS

## DESY Group

FS-CFEL-2

## Special Qualifications:

**Primary author:** KASSIER, Günther (FS-CFEL-2)

**Co-author:** KAERTNER, Franz (FS-CFEL-2 (Ultrafast X-rays Group))