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Gun5.1 at PITZ: RF conditioning and first characterization

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A new generation of normal conducting 1.3GHz RF gun was developed to provide a high-quality electron source for superconducting linac driven free-electron lasers like FLASH and European XFEL. Compared to the Gun4 series, Gun5 aims for a 50% increase of the duration of the RF pulse (up to 1 ms at 10 Hz repetition rate) combined with high gradients (up to ~60 MV/m at the cathode). The first prototype of the new RF gun was manufactured at DESY and installed at the Photo Injector Test facility at DESY in Zeuthen (PITZ) in October 2021. In mid-October 2021 the RF conditioning began, aiming for achieving the aforementioned RF parameters.
The first characterization of Gun5.1 included measurements of RF amplitude and phase stability (pulse-to-pulse and along 1 ms RF pulse). The dark current was measured at various peak power levels. The current status of the RF conditioning will be presented as well as results of the first characterization.

Summary

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