

# Noninvasive Cavity-Based Charge Diagnostic for Plasma Accelerators

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The charge of an electron bunch is one of the most fundamental parameters in accelerator physics. Therefore, several techniques to measure the electron bunch charge exist. However, many conventional charge diagnostics face serious drawbacks when applied to plasma accelerators. For example, integrating current transformers (ICTs or toroids) have shown to be sensitive to the EMP originating from the plasma, whereas scintillating screens are sensitive to background radiation such as betatron radiation or bremsstrahlung and only allow for a destructive measurement of the bunch charge. We show measurements of a noninvasive, cavity-based charge diagnostic (so-called DaMon), which demonstrate its high sensitivity, high dynamic range and resistance towards plasma EMP. The measurements are compared to both an ICT and a scintillator screen.

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