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LARGE ELECTRODE SYSTEM MEASUREMENTS OF FIELD EMISSION INDUCED OPTICAL EMISSION SPECTRA

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Optical light spectra have been observed during field emission tests with Cu, CuCrZr, Nb and Ta electrode pairs in the CERN pulsed DC systems. Spectra for Cu and CuCrZr have been reliable and repeatable displaying an increase in light intensity proportional to the field-emitted current. The spectra obtained for Cu-based materials resemble the reflectance spectrum for Cu, which is likely the result of multiple reflections from the Cu surface between the emission point to the vacuum chamber window. Nb and Ta both emitted light for a limited duration of time which stopped after a breakdown, where the breakdown is identified by a spike in pressure. Analysis has shown a correlation between light intensity, detected by both the spectrometer and cameras, and the field-emitted current.

Topic

Field Emission

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