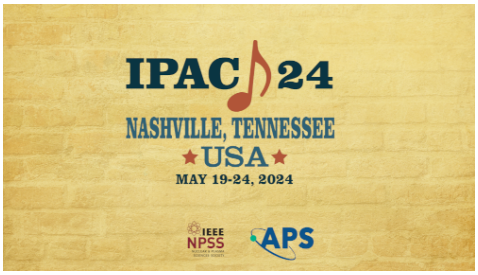

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Empirical modeling of the photocurrent time-dependence in co-deposition activation procedures for GaAs photocathodes

Monday, 20 May 2024 16:00 (2 hours)

GaAs-based photocathodes can provide electron beams with high spin-polarization. In order to be used in a photo-gun for high-current applications such as energy-recovery linacs and colliders, the quantum efficiency as well as the lifetime of the photocathode needs to be as high as possible. Both parameters depend on the quality of the thin layer that is applied to the photocathode surface during the so-called activation process in order to create negative electron-affinity conditions for optimal photoemission. Hence, it is of great interest to optimize and standardize this procedure in order to provide the best possible photocathode performance for accelerator applications.
For an automatization of the activation process it is necessary to model the photocurrent as a function of time during the process. To this end, activations of bulk-GaAs using Cs and O, conducted at the Photo-CATCH test stand, were analyzed using an empirical model function. This contribution presents the results of the analysis and its implications regarding the influence of the activation process on the performance of the activated photocathode.

Footnotes

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