

Multi-alkali antimonide photocathodes for highly brilliant electron beams

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The goal of the Sealab/bERLinPro project is to build a new generation superconducting RF electron accelerator at HZB. Therefore, a photocathode with high QE and long operation lifetime is required for this project. Multi-alkali antimonide photocathodes deposited on Mo substrate is chosen for this application due to its high QE (>1%) at visible wavelengths and good thermal conductivity.

Currently, Na-K-Sb photocathodes are produced in UHV preparation chamber at our photocathode lab. The influence of deposition parameters is studied in order to optimize the growth procedure and to achieve better stability at higher temperature (compared to photocathodes with Cs composition), which could benefit operational lifetime. XPS and QE measurements are performed, and the correlation between chemical composition and QE value are presented in this contribution.

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