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Design and operation of a commercial molecular beam reactor for alkali antimonide growth

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Alkali antimonide epitaxy and the demonstration of very high quantum efficiencies (QEs) from ultrathin films has been an exciting development of the last few years. With goals of superb film uniformity, physical/chemical roughness, and control of stoichiometry and defect densities, comes an increased emphasis on highly capable growth systems. We report on the design and performance of a new molecular beam reactor system for alkali antimonide photocathode preparation. Calibration of effusion cell flux, low temperature effusion cell stability, and routine operation is described. Photoemissive performance is presented for the most recent thin films grown, using a new rapid spectral QE profiler which enables real-time feedback for stoichiometric control during co-evaporation.

Footnotes

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North America

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