

Cockcroft Institute Colloquium

Application of GaAsP Photocathodes in Accelerator Injectors

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Abstract

Activated to negative electron affinity (NEA) GaAsP(Cs,O) photocathode at the wavelength $\lambda = 532$ nm can potentially reach quantum efficiency as high as 50%. This value is approximately two times higher than the similar value of GaAs(Cs,O) photocathodes. This fact originates from the wider bandgap of GaAsP which cause the higher value of NEA of activated photocathode comparing to GaAs(Cs,O). These facts indicates that GaAsP photocathodes is a promising candidate for applications in the high current accelerator injectors. In this report the results of the Research and Development Contract between ASTeC and ISP SB RAS are presented. These include R&D on optimization of GaAsP semiconductor structures for reflection mode photocathodes, R&D on surface clearing and activation procedures of GaAsP, investigation of emitted photoelectron energy distribution, and the comparative study of the QE spectra and operational life-times of GaAsP(Cs,O) and GaAs(Cs,O) – photocathodes.