

Ultra-thin MgO films on metal photocathodes to enhance QE

Wednesday, 21 September 2022 09:00 (20 minutes)

Metal photocathodes are widely utilised for their ease of use, high durability and fast response time. However, the high work function (WF) and low quantum efficiency (QE) typically observed in metals necessitates the use of high power deep UV lasers. Metal oxide films on metals have been shown to produce a surface with a lower WF and improved QE* whilst maintaining photocathode durability.

We present an overview of experimental work conducted to apply ultra-thin MgO films on copper and silver photocathodes, and a study of their performance as candidates for future photocathode applications. We show their the surface properties and photoemissive characteristics, including surface composition and roughness, WF, QE and mean transverse energy (MTE) as a function of illumination wavelength.

*V. Chang, T. C. Q. Noakes, and N. M. Harrison. "Work function and quantum efficiency study of metal oxide thin films on Ag(100)". In: Physical Review B 97 (15 Apr. 2018), doi: 10.1103/PhysRevB.97.155436.

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