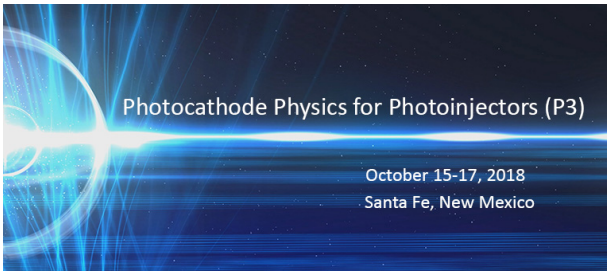

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Effects of Chemical and Physical Roughness on MTE

Monday 15 October 2018 14:40 (15 minutes)

The performance of x-ray light sources, such as free electron lasers, ultrafast electron diffraction systems and ultrafast electron microscopy, is limited by the brightness of the electron beam. Given the improvements in photocathode design and synthesis, the source surface roughness has become a key limiting factor on the intrinsic emittance, specifically the mean transverse energy (MTE), of the electron beam. Here we discuss how measurements of the source's spatially dependent height and surface potential variations can be used to compute the electron beam MTE. Our simulations show the importance of modeling the effects surface physical and chemical roughness simultaneously.

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