



Contribution ID: 1304 Contribution code: TUPA014

Type: **Poster Presentation**

## **Transport model and Monte-Carlo simulations for photoemission from thin film semiconductors under high fields**

*Tuesday, 9 May 2023 16:30 (2 hours)*

Semiconductor photocathodes, particularly those produced with thin films and heterostructures, are promising candidates of high brightness electron sources. It is also well-known that electron beam brightness increases with the photocathode gun's operating gradient. Combining both heterostructure semiconductor photocathode and cyro-cooled high-gradient photocathode gun may improve electron sources for many applications. However, effects of the high field gradient on the semiconductor photocathode need to be understood in order to preserve and optimize the quality of the emitted photo-electron beams, which can be done with from detailed simulation study and theoretical analysis. In this work, we apply Monte-Carlo method to study high field transport and emission from semiconductor photocathodes such as Cs<sub>2</sub>Te. The results will be used to inform a theoretical transport model based on the moments method and the cathode development for the CARIE project at LANL.

### **Funding Agency**

Work supported by the LDRD program at LANL.

### **Footnotes**

### **I have read and accept the Privacy Policy Statement**

Yes

**Primary author:** HUANG, Chengkun (Los Alamos National Laboratory)

**Co-authors:** ALEXANDER, Anna (Los Alamos National Laboratory); BAGCHI, Soumendu (Los Alamos National Laboratory); DIMITROV, Dimitre (Los Alamos National Laboratory); PEREZ, Danny (Los Alamos National Laboratory); SHINOHARA, Ryo (Los Alamos National Laboratory); SIMAKOV, Evgenya (Los Alamos National Laboratory); WANG, Gaoxue (Los Alamos National Laboratory)

**Presenter:** DIMITROV, Dimitre (Los Alamos National Laboratory)

**Session Classification:** Tuesday Poster Session

**Track Classification:** MC2: Photon Sources and Electron Accelerators: MC2.T02: Electron Sources