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## **Design and modeling of dielectric a wakefield accelerator with plasma ionized witness bunch**

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

A planned experiment at the Argonne Wakefield Accelerator (AWA) facility will demonstrate the plasma photocathode concept, wherein precise laser-based ionization of neutral gas within the wakefield driven by a relativistic particle beam generates a high brightness witness beam, which is accelerated in the wakefield. Replacing the plasma wakefield acceleration component with a dielectric wakefield acceleration scheme can simplify experimental realization by relaxing requirements on synchronization and alignment at the expense of accelerating gradient. However, this places rigorous constraints on drive beam dynamics, specifically charge, size, and relative separation. This paper presents progress on the design of such a hybrid scheme, including improved simulations accounting for anticipated beam properties and revised structure characteristics.

### **Funding Agency**

### **Footnotes**

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

Yes

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