



Contribution ID: 18

Type: **not specified**

Dielectric wakefield acceleration: application to linear colliders

Wednesday, 25 September 2024 09:00 (50 minutes)

We discuss the rich physics of dielectric wakefield acceleration (DWA), with an eye to applications. Newly uncovered physical limitations on achievable gradient are examined, as well as fundamental issues concerning beam stability. In the latter context we introduce the concept of strong, alternating gradient wake focusing. We discuss the wide varieties of wakefield structures now under consideration. With this background, we present two scenarios of wakefield-based colliders where the positrons are accelerated in DWA to avoid complications present in plasma – a dual DWA accelerator, and a PWFA/DWA hybrid design.

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