



Contribution ID: 73

Type: **Talk**

Black box optimization with TPE algorithm of ILC E-Driven Positron Source

Wednesday 22 October 2025 08:50 (20 minutes)

Since the ILC cannot reuse beams, it is necessary to generate a large number of particles, 31 mC/sec. In Electron-driven positron sources, it is important to find efficient generation conditions because the target load becomes large. We simulated the process in which an electron beam is injected into a W-Re target, the generated positrons are captured and accelerated by RF, and then collected within the DR acceptance, and conducted research on more efficient positron generation and capture conditions. The parameters under consideration include electron beam energy, target thickness, and various parameters of the positron accelerator. We adopted the Deep learning Black Box optimization method and used the TPE algorithm as the parameter exploration method. We report the current status.

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Session Classification: Electron and Positron Sources

Track Classification: Accelerator: Electron and Positron Sources