

8th High Power Targetry Workshop (HPTW2023)



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Development of ILC positron production target

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In the electron-driven positron source of the ILC (International Linear Collider), positrons are obtained by injecting 3-GeV electron beam into tungsten target. The average heat load of the tungsten part is about 20 kW, and a rotating target structure is adopted to disperse this heat load. For this target, it is necessary to design both a rotating structure and vacuum performance. Also, for cooling, tungsten requires bonding with a copper alloy. Brazing and hot isostatic pressing are available as joining methods for tungsten and copper alloys, but this time we are considering joining by Spark Plasma Sintering (SPS). In the SPS method, an intermediate layer is formed between tungsten and a copper alloy to bond them. By adjusting the mechanical properties of the intermediate layer, the thermal stress at the tungsten/copper alloy interface can be reduced. This time, we introduce the outline of the design of the ILC electron-driven positron source, the ongoing model test and the SPS bonding test of tungsten/copper alloy.

Themes for the contribution

6 Construction, fabrication, inspection, quality assurance:

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