

8th High Power Targetry Workshop (HPTW2023)



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Upgrades, fabrication and quality assurance of 1.3MW HyperK target

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The T2K target has operated successfully since the start of beam in 2010. During this time two targets have been installed and operated without failure. The second target has accumulated 3.1×10^{21} protons on target (POT) at 510kW beam power. With the current upgrade plans the beam power will be 1.3MW by 2026 which will push the target even harder. At this beam power the heat load on the target will be significantly higher and require a higher flow rate of helium to cool it. In addition the levels of radiation damage in the materials will equal the current experience in less than 1 years operation. A prototype HyperK target has been constructed to operate at elevated pressure to increase the cooling capacity. Further improvements are being implemented in the next operational targets to improve the quality and de-risk the manufacturing process. Another key issue for the HyperK targets are the ceramic isolators and seals on the helium pipes. In addition to the temperatures, pressure and radiation in operation, they are also exposed to rapid thermal cycles during beam trips. An extensive testing campaign is underway to validate and select suitable components before implementing them in the target station.

Themes for the contribution

6 Construction, fabrication, inspection, quality assurance:

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