

The graphite target for J-PARC neutrino beam-line

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The J-PARC neutrino beam-line is aiming to produce the high intensity neutrino beam for the long base-line neutrino-oscillation experiment, T2K [1]. The neutrino beam is produced by the decay in flight of the pions generated by the interaction of 30 GeV proton beam and the graphite target[2]. The target should withstand the exposure by 3.3×10^{14} protons that are extracted from J-PARC accelerator by Fast-extraction method in $5 \mu\text{s}$. The graphite is chosen as the material for the target because of its high melting point and sublimation temperature. The feature of the J-PARC neutrino beam-line is that it is cooled by He gas so that the graphite temperature become about $400 \sim 700 \text{ }^\circ\text{C}$ where the radiation damage of the graphite is reduced. J-PARC neutrino beam-line is operated from April 2009. The first target has been exposed by 6.7×10^{20} protons-on-target. The design and structure of the graphite target and the operation experience for 5 years will be presented.

[1] Nucl. Instrum. Meth. A 659, 106 (2011)

[2] Phys. Rev. D 87, 012001 (2013)