

Abstract Submitted
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Liquid Hydrogen Target Cooled by Liquid Helium for Pentaquark Experiment SHIGERU ISHIMOTO, KEK-IPNS, KENICHI IMAI, Kyoto Univ., KIMIO MORIMOTO, KEK-IPNS, DAISUKE NAKAJIMA, Tokyo Univ., SHOJI SUZUKI, KEK-IPNS, NOBUAKI TANAKA, KEK-IPNS, KEK-PS-E559 COLLABORATION — A liquid hydrogen target for the pentaquark experiment (KEK-PS, E559) has been successfully developed at KEK 12 GeV PS (proton synchrotron). The target sizes are 67.8 mm diameter and 110 mm length. The hydrogen vessel was made from PET (Polyethylene Terephthalate) for the cylinder, and Mylar for end caps. The vessel thickness was 0.12~0.32 mm. The cylinder material PET $t=0.3$ mm was obtained from a commercial PET bottle for drinking water. The hydrogen target was cooled by a heat exchanger and continuous flow of cold helium gas from liquid helium container. The cooling time from room temperature to full of liquid hydrogen at 20 K was about 3 hrs. The consumption of liquid helium was 1.3~2.0 l/hr during stable operation. In the preparation stage, the hydrogen pressure was stabilized at 110.9 ± 0.07 kPa for more than 10 hrs. The measured target temperature was 21.06 ± 0.015 K., then the fluctuation of hydrogen density was obtained as $\pm 2.3 \times 10^{-4}$.

Shigeru Ishimoto
KEK-IPNS

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