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The OPERA Target Tracker – large surface plastic scintillator detector for neutrino experiments.

The Target Tracker detector (TT) of the OPERA experiment was successfully used for the on-line neutrino events registration and the location of the neutrino events in the target bricks. The TT is built of 496 modules combined in 62 walls of 6.7 x 6.7 m2 which provide X-Y coordinates for particles registered in the detector. Each module is made of 64 plastic scintillator strips. Scintillator light is collected by wavelength shifting fibers and registered by multichannel PMTs at both sides. Thanks to the high quality of the polystyrene, the TT registration efficiency for MIP is about 99% with registration at both sides of the strip (at the threshold of 0.3 p.e.). The TT performance was monitored with muon tracks during the whole lifetime of the experiment since 2007. Only a small decrease (< 1.5%/year) in the signal amplitude was observed causing no degradation in MIP registration efficiency. In 2015 the decommissioning of the OPERA detector will start. Given its high performance, module structure and a large total surface of ~5500 m2 , the TT apparatus can be moved to another site and used in one of the next generation neutrino experiments as a veto or external muon tracker. The detailed features and performance of the TT detector are provided as well as suggestions of its possible future use.

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Track Classification: Long Baseline Oscillations