

Target Station Design for Neutrino Superbeams

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A conceptual design is presented for the target station and remote handling system of a multi-MW neutrino facility. This was originally developed for the EUROnu Super Beam study, which proposed a 4MW beam delivered to 4x 1MW pebble-bed targets operating in parallel. The target station was designed to cope with the unique demands of this 4 target arrangement, as well as challenges such as high activity and remote handling which are common to any high power facility. Although the EUROnu SB study has come to an end, many of the concepts developed here will be relevant to other current and proposed neutrino facilities.

EUROnu would have required construction of a completely new target station; this allowed every part of the facility to be designed and optimised from the ground up. The emphasis was on maximising uptime and ensuring safety, while minimising the costs of construction, operation and maintenance. The design concept was based on the target station of T2K, which was designed for comparable levels of beam power and activation and has been in operation for several years. The knowledge and practical experience gained from T2K were considered throughout the design process.

Summary

A conceptual design is presented for the target station and remote handling system of a multi-MW neutrino facility, originally developed for the EUROnu Super Beam study.

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