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Session 9: Determination of the mass ordering and search for CP-invariance violation

Hadroproduction experiments to constrain accelerator-based neutrino fluxes

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The knowledge of (anti-)neutrino fluxes is one of the largest limitation in accelerator-based precision neutrino experiments. The main limitation arise from the poorly known production cross section of neutrino parents in hadron-nucleus interactions.

Strategies used by neutrino experiment to constrain their fluxes using external hadroproduction data will be described and illustrated with an example of a tight collaboration between T2K and NA61/SHINE experiments. This enabled a reduction of the T2K neutrino flux uncertainty from $\sim 25\%$ (without external constraints) down to $\sim 10\%$. On-going developments to further constrain the T2K (anti-)neutrino flux will be discussed and recent results from NA61/SHINE will be reviewed.

As the next-generation long baseline experiments aim for a neutrino flux uncertainty at a level of a few percent, the future data-taking plans of NA61/SHINE will be discussed.