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## HARP collaboration results on proton-nuclear interactions at a few GeV energies

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Recent results obtained by the HARP collaboration on the measurements of the double-differential production cross-section of positive and negative pions in interactions of 3-12 GeV/c protons with nuclear targets from Beryllium to Lead are presented.

They cover production at small angles (30-210 mrad) and relatively large momenta up to 8 GeV/c as well as large angles (0.35 - 2.15 rad) and small momenta (0.1 - 0.8 GeV/c).

These results are relevant for detailed understanding of neutrino fluxes in accelerator neutrino experiments, better prediction of atmospheric neutrino fluxes, optimisation of a future neutrino factory design and for improvement of hadronic generators widely used by the HEP community in the simulation of hadronic interactions. To the latter, some comparisons of our data to the generators implemented in the Geant4 code are given.

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