Pion-Proton scattering at TRIUMF and PSI

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From πp observables, important quantities of the strong interaction can be extracted: the πNN coupling constant, the sigma-term of the proton and the size of isospin breaking.
Presently, there is no agreement on the value of any of these quantities [1]. This is partly due to the status of the πp data base, in particular at low energies. There are regions where information is still missing, and there are regions where the available experimental data are contradictory. New measurements of πp observables at low energies are aimed at providing additional information and resolving the discrepancies. While elastic scattering data are primarily needed for the extraction of the sigma-term, more information on the single charge exchange (SCX) reaction π^-p$\rightarrow$ π°n should lead to a better determination of the size of isospin violation.
Elastic scattering cross sections have been measured with the CHAOS detector at TRIUMF for several pion energies down to 15 MeV. A large angular range has been covered with special emphasis on forward angle measurements in the Coulomb-nuclear interference region. Elastic scattering polarization observables have been measured both with the CHAOS detector and with the LEPS spectrometer and an active polarized target at PSI. An experiment measuring the SCX total cross section from 30 to 250 MeV using a transmission technique has started taking data at PSI.
Status and/or results of these experiments will be discussed.

References

[1] Ulf-G. Meißner; M. Pavan et al.; M. E. Sainio;
πN Newsletter 16 (in press), http://menu2001.phys.gwu.edu/menu2001/proceedings