Recent results in nucleon-nucleon and nucleon-hyperon interaction at small relative energies will be discussed. The high resolution data on inclusive pion and kaon productions in the proton-proton collision measured at COSY will be presented. The $pp \rightarrow \pi^+ + np$ and $pp \rightarrow K^+ + \Lambda p$ reactions were investigated using Final State Interaction methods.

An excellent description of the $pp \rightarrow \pi^+ + np$ data was obtained applying Watson theorem of FSI for the spin triplet state while no spin singlet could be found [1]. The ratio of the well known cross sections for $pp \rightarrow \pi^+ + d$ and new data for $pp \rightarrow \pi^+ + np$ reactions was investigated and compared with results of the Fäldt and Wilkin extrapolation theorem which relates np bound and scattering state in S-wave. However, bad description of this experimental ratio was found using Fäldt and Wilkin approach especially at energies above $\Delta$ resonance where production of bound deuteron is only roughly 50% of the pn continuum [2]. More precise three body calculations with tensor forces and S-D coupling still do not explain these differences.

The high resolution $pp \rightarrow K^+ + \Lambda p$ data together with previous total cross section data for free $\Lambda p$ scattering were analyzed simultaneously using the Jost function approach [3]. The $\Lambda p$ singlet and triplet scattering length and effective range were deduced. Spin singlet and triplet contributions to the $pp \rightarrow K^+ + \Lambda p$ cross section will be discussed.

The total cross section for $pp \rightarrow K^+ + \Sigma^+ n$ reaction close to threshold was determined and it was found to be much smaller than a previous measurement in the same energy range. The data together with previous results at higher energies indicate that the energy dependence of the total cross section for $pp \rightarrow K^+ + \Sigma^+ n$ is compatible with a phase space dependence.


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