# Strange Quark Physics at HERA

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The valence quark content of the proton is well established whereas the flavor decomposition of the sea has not yet been fully investigated. The possible strange content of the proton is currently of considerable experimental and theoretical interest. Experimental constraints on the size of the strange sea in the proton came mainly from charm production in charge-current neutrino interactions. The strange quark densities are extracted in course of the global QCD analyses and parameterized differently by CTEQ, MRST and GRV. For instance, in the GRV parametrization assumed a vanishing of strange quark density at a very low scale $Q^2 = \mu^2$.

On the other hand, a surprisely large cross section of $\phi(1020)$ meson production in low-energy $p\bar{p}$ annihilation measured at LEAR and strong violation of the OZI rule, inspire a theoretical idea about a large $s\bar{s}$ component in the proton wave function.

In this talk will be covered the following topics:

- the new results on $\phi$-meson production in neutral current $e^+p$ deep inelastic scattering at the HERA collider and its sensitivity to the strange sea of the proton. The $\phi$-meson cross section in the current region of the Breit frame have a significant contribution from the hard scattering of a virtual photon on the strange sea of the proton;
- new data on strange meson ($K_s$, $K^*$) and barion ($\Lambda$, $\Sigma$, $\Xi$) production and the strangeness suppression factor in DIS and photo-processes;
- contribution of different mechanisms to strange particle production in high energy $e^+p$ collisions.