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Studies of light mesons at COMPASS

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COMPASS is a fixed-target experiment at the CERN SPS aimed to study the structure and dynamics of hadrons. Data with negative (mostly π^-) hadron beams of 190 GeV/c has been taken to study in particular light mesons. Their spectrum is investigated in diffractive dissociation reactions with final-states containing π and η. At four-momentum transfers to the target between 0.1 and $1.0\,\mathrm{GeV}^2/c^2$ the properties of known resonances are studied, and new, possibly exotic, states are searched. Novel analysis techniques have been developed to also probe the sub-systems of the final-states.

The structure of light mesons is studied in photo-production reactions induced by a pion beam scattering off solid targets. The radiative widths of the $a_2\,(1320)$ and, for the first time, that of the $\pi_2\,(1670)$ have been extracted from COMPASS data. In addition these reactions can be used to measure the polarizability of the π, and compare this to predictions of chiral perturbation theory.

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