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Recent results from the COMPASS experiment

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The goal of the COMPASS experiment at CERN is to study the structure and dynamics of hadrons. The two-stage spectrometer has a good acceptance over a wide kinematic range for charged as well as neutral particles and thus allows to access a large range of reactions. Light mesons are studied with negative (mostly π-) and positive (p, π+) hadron beams with a momentum of 190 GeV/c. The spectrum of light mesons is studied in diffractive reactions of those beams on a liquid hydrogen target with a four-momentum transfer between 0.1 and 1.0 GeV^2/c^2. In the π-π-π+ channel COMPASS has recorded the currently largest data set. Using novel analysis methods, these data not only allow to measure the properties of known resonances with high precision, but also to search for new states. Among these is a new axial-vector meson with a mass of 1.4 GeV/c^2. Findings in the π-π-π+ channel are supplemented by the π-π0π0 final state. Additional insight is gained from channels with η or η' in the final-state, or centrally produced systems. The structure of light mesons is studied with a negative pion beam scattering off solid targets, either lead or nickel. Primakoff reactions at low momentum transfers allow to determine the polarisability of the pion, and thus to test predictions by chiral perturbation theory. Additionally, these reactions are used to determine the radiative widths of a2(1320) and π2(1670).

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