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Hadron structure from lattice QCD[1]

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More than 99 per cent of the mass of the visible world resides in hadrons which are bound states of quarks and gluons, the fundamental constituents of Quantum Chromodynamics (QCD). The proton is at the heart of the hadronic matter and is an ideal laboratory for studying the QCD dynamics. Lattice QCD (LQCD) is a powerful non-perturbative tool for the ab inition calculation of hadron observables that are well determined experimentally, or not easily accessible in experiment. Progress in the simulation of LQCD has been impressive, mainly due to improvements in the algorithms, development of new techniques and increase in computational power, that have enabled simulations to be carried out at parameters very close to their physical values. In this talk I will present recent developments in hadron structure focusing on achievements in the evaluation of nucleon quantities, such as the nucleon charges, form factors, and gluonic contributions, in view of simulations close or at the physical value of the pion mass. I will also discuss the enormous efforts towards a new direct approach to compute quark parton distributions functions on the lattice.

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