

Weak charge of the proton

Ross D. Young

Department of Physics, The University of Adelaide, Adelaide, South Australia 5005, Australia.

The weak charge of the proton encodes the strength of the neutral-current coupling to a proton. Here we report on a recent determination of this coupling in parity-violating electron–proton scattering. As a precision search for a the signature of new physics, we highlight some of the particular features of the standard model “background” associated with the finite structure of the proton—notably the strange quark content of the proton and the γZ -box radiative correction. The final result is found to be in excellent agreement with predictions of the standard model, producing bounds on particular new physics interactions at the multi-TeV mass scale.