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**The mechanical size of the proton.** VOLKER BURKERT, LATIFA ELOUADRHIRI, Jefferson Lab, FRANCOIS-XAVIER GIROD, University of Connecticut — Protons are fundamental building blocks of our universe. They are composed of elementary objects, quarks and gluons. It is well established that quarks do not exist in isolation but only in the confines of protons and other hadrons. The mechanical properties of the proton including the size of the confinement volume can in principle be probed in interactions that couple directly to the quark masses through gravitation. These properties are encoded in the proton's matrix element of the energy-momentum tensor and are expressed in the gravitational form factors (GFF). Use of direct gravitational interaction in such measurements is impractical. However, recent theoretical developments have shown that the GFF may also be probed indirectly in deeply virtual Compton scattering (DCVS). This new direction of nucleon structure research has already resulted in the first determination of the pressure distribution inside the proton. Here we present the first results on the mechanical size of the proton employing the DVCS process in extracting the form factor D(t). We will compare our results to the frequently discussed charge radius of the proton and to the sizes of other hadrons.

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