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New insights into nuclear physics and weak mixing angle using electroweak probes

In this talk we will present the first measurement of the neutron skin of cesium and iodine using electroweak probes, coherent elastic neutrino-nucleus scattering and atomic parity violation. This measurement, differently from hadronic probes, is model-independent and suggests a preference for nuclear models which predict large neutron skin values, with implications that range from neutron stars to heavy ion collisions.

Moreover, we will show a new determination of the low-energy weak mixing angle, with a percent uncertainty, fully determined from electroweak processes and independent of the neutron radius of cesium, allowed to vary in the fit. This will permit to put reliable constraints to theories beyond the standard model.

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