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Light Hypernuclei : a Testbed for Charge Symmetry Breaking

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Charge symmetry is broken in QCD by the up-down quark mass difference and electromagnetic interactions. In Λ hypernuclei, charge symmetry breaking (CSB) manifests itself in a charge dependence of Λ separation energies.
At the Mainz Microtron MAMI the novel method of high-resolution spectroscopy of decay-pions in strangeness electroproduction was established to measure Λ separation energies. A sizable CSB effect was reaffirmed for the A = 4 mirror pair and until recently it could not be reproduced in any ab initio 4-body calculation.
The full understanding of this large and spin-dependent effect remains one of the unresolved issues of hypernuclear physics.

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