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【536】Laser Cooling of Molecular Anions for Sympathetic Cooling of Antiprotons

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Several experiments at CERN aim at testing the CPT-theorem and weak equivalence principle using antimatter, among them the AEgIS experiment. Here, antihydrogen - produced via resonant charge exchange - will be used for precision measurements where the achievable sensitivity is determined by the temperature of the antiprotons.

We are investigating laser-cooling of anionic molecules to sympathetically cool antiprotons. A test setup to produce cold C2- molecules is currently being commissioned. This will be presented together with theoretical studies on the feasibility of several laser-cooling schemes.

The unprecedented laser-cooling of anions would also enable sympathetic cooling of any other negatively charged species, opening new opportunities in a variety of research areas.

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