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Dissertation Award in Nuclear PhysicsTalk: An Introduction to the MuCap Experiment¹

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MuCap is a collaborative effort to make a high precision measurement of the rate of nuclear muon capture in hydrogen gas. Muon capture is of contemporary interest because its large momentum transfer makes it uniquely sensitive to the nucleon's pseudoscalar coupling g_P , which is currently the least well known of the nucleon's electroweak form factors. In 2007 MuCap published its first results, reporting the most precise determination of g_P to date. In this talk I will give a general introduction to the MuCap experiment by discussing the rich physics surrounding muon capture, surveying previous experiments in the field, and describing the techniques that distinguish MuCap from its predecessors.

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