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Tensor interaction constraints from β decay daughter nucleus spin asymmetry of trapped atoms[1] J.A. BEHR, TRIUMF, J.R.A. PITCAIRN, D. ROBERGE, U. British Columbia, O. AVIV, D. ASHERY, Tel Aviv U., A. GORELOV, P.G. BRICAULT, M. DOMBSKY, J.D. HOLT, K.P. JACKSON, B. LEE, M.R. PEARSON, A. GAUDIN, B. DEJ, C. HÖHR, TRIUMF, G. GWINNER, U. Manitoba, D. MELCONIAN, Texas A&M — Parity violation was discovered in 1957 in β decay by measuring the asymmetry of electron emission with respect to the nuclear spin. Other observables besides this β asymmetry were immediately proposed. Treiman realized that the asymmetry of emission of the daughter nuclei would be the sum of β and ν asymmetries, and that for decays that change nuclear spin it would vanish for some types of weak interactions, making it a sensitive probe of other types. But the low-energy daughter nuclei would stop in a few atomic layers of material, making direct detection difficult. We have used laser trap technology to measure Treiman's observable. The nuclear recoils escape the laser trap, and we were able to measure their emission asymmetry to percent accuracy. The result is consistent with zero as predicted in the modern electroweak model, and constrains a certain type of interaction ('tensor') complementary to other experiments.

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