

PHYSICS AND ASTRONOMY COLLOQUIUM

Gerald Gwinner, Ph.D.

University of Manitoba

The most accurate test of relativistic time dilation: How Doppler-free spectroscopy can measure the Doppler effect.

We report on the concluding results from a series of Ives-Stilwell-type experiments carried out using collinear laser spectroscopy on Li^+ ions stored at speeds ranging from 3% to 34% of the speed of light at the TSR and ESR heavy ion storage rings. We have achieved absolute frequency accuracies for optical transitions at the 10^{-10} level, possibly the most accurate measurement ever carried out on accelerated beams. We have verified the relationship between the velocity β and the time dilation factor γ to within $\pm 2.3 \times 10^{-9}$, setting the tightest limits on deviations of time dilation from Special Relativity. We will discuss the relevance to Lorentz & CPT violating Standard Model extensions.



THURSDAY, MARCH 3, 2016 | 4:00 PM | HAWKING AUDITORIUM



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