

Abstract Submitted
for the 4CF15 Meeting of
The American Physical Society

Test of Gravitational Time Dilation JONATHAN SCHILLER, PATRICK O'SHEA, ROBERT OLESEN, DAVID EMANUEL, BRIAN PATTERSON, JERRY SELL, ALINA GEARBA, MARIO SERNA, United States Air Force Academy, SHANE BURNS, JEFF STEELE, Colorado College — Colorado College and USAFA have collaborated on a demonstration of gravitational time warping... the same effect highlighted in the movie *Interstellar*. Time flows more slowly in a region of stronger gravity. In the movie, one hour on the surface of an alien planet near a black hole equated to seven years of time on earth. We have demonstrated this effect (on a much smaller scale!) by comparing the difference between the time at sea-level versus 7000 feet. Because GPS reports sea-level time, we compare an atomic clock to GPS time to measure the time difference. We observed that, at 7000 feet, our days are 20 nanoseconds longer than at sea level, consistent with the predictions of general relativity. Both USAF Academy and Colorado College have demonstrated the extra 20 nanoseconds per day. We also report recent measurements taken at the summit of Pikes Peak, at an altitude of 14,115 feet above sea level.

Brian Patterson
United States Air Force Academy

Date submitted: 11 Sep 2015

Electronic form version 1.4