

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Experimental Evidence for Mixed Reality States**<sup>1</sup> VADAS GINTAUTAS, ALFRED HUBLER, Center for Complex Systems Research, Department of Physics, University of Illinois at Urbana-Champaign — We present experimental data on the limiting behavior of an inter-reality system: a virtual pendulum with a bi-directional instantaneous coupling to its real-world counterpart [Gintautas & Hubler, Phys.Rev.E 75, 057201 (2007)]. The data show that if the physical parameters of the simplified virtual system are close to the parameters of the real system, there is a phase transition from an uncorrelated dual reality state to a mixed reality state in which the motion of the two pendulums is highly correlated. As virtual systems better approximate real ones, even weak couplings in inter-reality systems may induce sudden transitions to mixed reality states. This phenomenon may be typical for systems with instantaneous coupling and was recently featured on the tip sheet of the American Physical Society [<http://www.aps.org/about/tipsheets/tip68.cfm>]. We show that mixed reality states in physical systems are related to out-of-body experiences of humans in 3D-video feedback systems [H. H. Ehrsson, The Experimental Induction of Out-of-Body Experiences. Science 317, 1048 (2007)].

<sup>1</sup>This work is supported in part by the NSF grant DMS 03-25939 ITR.

Alfred Hubler  
Center for Complex Systems Research, Department of Physics,  
University of Illinois at Urbana-Champaign

Date submitted: 04 Dec 2007

Electronic form version 1.4