

Abstract Submitted  
for the NWS06 Meeting of  
The American Physical Society

**Implementing Hardy's Test of Local Realism** M. BECK, M.D. OLMSTEAD, J.A. CARLSON, Whitman College — We have performed a test of local realism using entangled photons produced by spontaneous parametric downconversion. This experimental test is based on an idea originally proposed by Hardy for a test of local realism without inequalities [1], although our experiment actually measures an inequality (as any experiment must). We find a more-than-70 standard deviation violation of the predictions of local realism. The experimental effort required for this test is essentially the same as that required for a test of a Bell inequality. However, this test is based on concepts that are easier to understand and more compelling than those behind the original Bell inequality. Furthermore, we have implemented this experiment in an undergraduate teaching laboratory.

[1] L. Hardy, Phys. Rev. Lett. **71**, 1665 (1993).

Mark Beck  
Whitman College

Date submitted: 12 Apr 2006

Electronic form version 1.4