

APR06-2005-000057

Abstract for an Invited Paper  
for the APR06 Meeting of  
the American Physical Society

### **Higgs Hunting at Hadron Colliders**

THOMAS JUNK, University of Illinois at Urbana-Champaign

The success of the  $SU(2)_L \times U(1)_Y$  gauge model of the electroweak interactions relies on the breakdown of its symmetry to the  $U(1)_{EM}$  group at low energies. The simplest mechanism for the spontaneous breakdown of this symmetry predicts the existence of a Higgs field with a nonzero vacuum expectation value, and the existence of a single scalar, observable particle, the Higgs boson. Supersymmetric models require at least two complex Higgs doublet fields with five physical Higgs states, and more exotic models predict even richer phenomena. Data accumulated to date favor models with a light Higgs boson, but direct searches have not yet shown evidence for such a particle. Constraints have been placed on the parameters of the Higgs sectors of many models. The current status of Higgs boson searches at the Tevatron will be reviewed, as well as projections for future sensitivity. The sensitivity of the LHC experiments to Higgs boson signals will also be reviewed.