Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Binary Black Holes: Are the Scalar-Tensor and General Relativistic Versions Indistinguishable?[1] CLIFFORD WILL, Washington University, St. Louis — It is known from a theorem of Hawking that asymptotically flat, stationary black holes in Brans-Dicke theory are identical to those in general relativity, because any scalar "hair" is radiated away, leaving a spatially constant field that leaves the geometry indistinguishable from general relativity. What about binary black holes in generic Scalar-Tensor (ST) theories? We argue that recent work analyzing ST black holes in a background cosmology, ST binary black holes in post-Newtonian theory and perturbation theory, and ST black hole mergers using numerical relativity suggest that vacuum, asymptotically flat binary black holes in ST theories without a scalar field potential may be observationally indistinguishable from their counterparts in general relativity.

[1]Supported in part by the NSF, PHY 09-65133

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Date submitted: 05 Jan 2012 Electronic form version 1.4