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**Gravitational radiation from compact binaries in scalar-tensor gravity** RYAN LANG, University of Florida — General relativity (GR) has been extensively tested in the solar system and in binary pulsars, but never in the strong-field, dynamical regime. Soon, gravitational-wave (GW) detectors like Advanced LIGO will be able to probe this regime by measuring GWs from inspiraling and merging compact binaries. One particularly interesting alternative to GR is scalar-tensor gravity. We present the calculation of second post-Newtonian (2PN) gravitational waveforms for inspiraling compact binaries in a general class of scalar-tensor theories. The waveforms are constructed using a standard GR method known as "Direct Integration of the Relaxed Einstein equations," appropriately adapted to the scalar-tensor case. We find that differences from general relativity can be characterized by a reasonably small number of parameters. Among the differences are new hereditary terms which depend on the past history of the source. In one special case, mixed black hole-neutron star systems, all differences from GR can be characterized by only a single parameter. In another, binary black hole systems, we find that the waveform is indistinguishable from that of general relativity.

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