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Gravitational radiation from compact binaries in scalar-tensor gravity RYAN LANG, Univ of Illinois - Urbana — 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 tensor and scalar 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. The tensor waveforms are calculated to second post-Newtonian (2PN) order, where "0PN" is equivalent to the lowest order GR result. The scalar waveforms are calculated to 1.5PN order. We also calculate to 1PN order the rate at which both tensor and scalar waves carry energy away from the system.

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