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Gravitomagnetic tidal resonances in binary inpirals ERIC POISSON, SIMON ALEXANDRE PEKAR, University of Guelph — The normal modes of oscillation of neutron stars have frequencies that lie beyond the band of interferometric gravitational-wave detectors, and they therefore provide little opportunity to generate resonances that could have an impact on the orbtial dynamics of binary inspirals. An exception are g-modes, which have comparatively low frequencies, and the associated resonances were studied by Lai [MNRAS 270, 611 (1994)]. Another exception is the r-modes of a rotating star, whose frequencies are a numerical factor times the spin frequency of the star, and which can therefore lie within the LIGO/Virgo frequency band. The r-modes are driven mostly by a gravitomagnetic tidal interaction (involving the post-Newtonian vector potential), and the associated resonances were studied by Flanagan and Racine [PRD 75, 044001 (2007)]. But the r-modes are a special case of the broader class of inertial modes first identified by Lockitch and Friedman [ApJ 521, 764 (1999)], and the gravitomagnetic tidal interaction drives all these modes. In this talk I describe the inertial-mode resonances that result when a rotating neutron star is subjected to gravitomagnetic tidal field produced by an orbiting companion, as well as the consequences they might have on the orbital dynamics of binary inspirals.

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