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Gravitational waves from neutron star mountains

Many LMXBs are spinning within a narrow frequency range, considerably lower than the neutron star break-up frequency. Gravitational wave emission might account for this observed maximum spin cap. For an isolated neutron star to emit gravitational waves, it must deform from its axial symmetry to produce a time-varying gravitational field. One way this can occur is through the development of a misaligned quadrupole moment. A quadrupole moment or 'mountain' can develop if temperature asymmetries exist in a neutron star crust. We are investigating how temperature asymmetries can develop through deep crustal heating via accretion and the role the magnetic field plays in the thermal conductivity of the crust.

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