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Non-dissipative fluid couplings in rotating superfluid neutron stars and application to pulsar glitches

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We have computed stationary and axisymmetric configurations of uniformly rotating superfluid neutron stars in a fully general relativistic framework with realistic equations of state. At low rotation rates, the neutron superfluid and the rest of the star are not only coupled by entrainment, but general relativity leads to an additional coupling through frame-dragging effects, which is likely to affect the dynamics of superfluid neutron stars. Using a quasi-stationary approach, we then discuss the role of general relativity on the global dynamics of giant pulsar glitches.

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