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Universality of the relativistic correction to glitch rise-times

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Despite its importance in determining the interior structure of neutron stars has been universally acknowledged, Einstein's theory of General Relativity has been up to now mostly neglected in the study of pulsar glitches. Its inclusion into the existing Newtonian models seems to be too expensive, compared to the moderate qualitative gain in accuracy and comprehension it gives. However, as the resolution of pulsar timing techniques increases, it will be soon important to be able to isolate the relativistic contributions to the glitch amplitude and rise-time, for a reliable quantitative comparison with observations. We will present, here, a simple universal formula for the relativistic correction to the glitch rise-time, given as a pure function of the compactness of the neutron star. It has been derived directly from Carter's multifluid hydrodynamics and can be easily employed to correct, a posteriori, any Newtonian estimation for the coupling time scale, without any computational expense.

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