

## Glitches as Probes of Neutron Star Internal Structure and Dynamics

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Glitches, sudden spin-up of pulsars with comparatively longer recovery, provide us with a unique opportunity to investigate various physical processes, including the crust-core coupling, distribution of reservoir angular momentum within different internal layers, spin-up in neutral and charged superfluids and constraining the equation of state of the neutron star matter. In this work, depending on the dynamic interaction between the vortex lines and the nuclei in the inner crust and between the vortex lines and the magnetic flux tubes in the outer core various types of the relaxation behaviors are obtained and confronted with the observations. It is shown that the glitches have strong potential to deduce information about the cooling behavior and interior magnetic field configuration of neutron stars. Some implications of the relative importance of the external spin-down torques and the superfluid internal torques for recently observed unusual glitches are also discussed.

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