The small-scale magnetic field and the evolution of pulsar rotation in the framework of three-component model of neutron star

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We consider the evolution of pulsar rotation assuming that the star consists of crust component (which rotation is observed) and two core components. All components are supposed to rotate as rigid bodies. One of the core components contains pinned superfluid which can, for some reasons, suddenly inject some small fraction of stored angular momentum in it. In the framework of this toy model the star can demonstrate glitch-like events together with long period precession (with period $10 - 10^4$ years). This precession can survive on pulsar braking time-scale if the external electromagnetic torque acting on neutron star has an equilibrium inclination angle. It can take place for instance if pulsar tubes are bended by small-scale magnetic field. The details of the model describing the influence of small-scale field on external torque see in [1].

References

[1] D.P. Barsukov, P.I. Polyakova, A.I. Tsygan *Astronomy Reports* 53, 1146 (2009)

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