

The apparent decay of pulsar magnetic fields

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Abstract

© Published under licence by IOP Publishing Ltd. Neutron stars are extremely strong cosmic magnets which fields are expected to decay with time. Here we report on the simple test of this process. Adopting a novel approach, we have estimated surface magnetic fields B for 76 radiopulsars (the most numerous subclass of the known isolated neutron stars) which ages t are known independently. Focusing on the accurate evaluation of the precision of both quantities, we determined a significant power-law trend $B(t) \propto t^{-\beta}$ with index $\beta = 0.19 \pm 0.05 \pm 0.06$ at 95% C.L. The effects of the observational selection turn this value into the upper limit for the intrinsic field decay rate. If so, then neutron star crusts are close to the "impurity-free crystals", which results in a relatively slow magnetic fields decay.

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