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Observational signatures of superfluid neutron star turbulence

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The superfluid in the interior of a mature neutron star plays a key role in many observational phenomena, with the most striking example being pulsar glitches.

Very few models, to date, have however considered the observational signature of turbulence in the superfluid, a phenomenon that is well known to develop in laboratory superfluids. In this talk will discuss the theoretical framework to apply our understanding of laboratory superfluids to the neutron star crust when pinning is present (a regime not explored in the laboratory), and show the expected signature on pulsar glitches.

I will then compare the results to observations of glitches in the Vela pulsar and in PSR J0537-6910 and discuss the physical constraints that can be obtained.

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