

# FAST Proposal Coverpage

Last updated: 01/10/2019

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**Project Name:** A FAST proposal for a slow pulsar

## **Project Summary:**

We recently discovered the slowest rotating pulsar known with LOFAR telescope. The period of this pulsar, 23.5 s, is about two times longer than that of the second slowest radio pulsar known, and also about two times slower than the slowest magnetar known. The pulsar occupies a relative empty part of the P-Pdot diagram, suggesting that PSR J0250+5854 could be the first of a new population of pulsars discovered. This discovery presents a challenge to both understanding the population and evolution of radio pulsars and their emission mechanism. To date the pulsar has only been detected at frequencies below 400 MHz and the proposed observation would be about 30 times more sensitive compared to the current L-band upper limit, and the known spectral index implies a clear detection. Subject to scheduling constraints, there is the agreement for simultaneous LOFAR data to be obtained. The FAST data combined with the low frequency LOFAR data allow the beam geometry to be studied. The pulsar also shows extreme variations in its pulse to pulse behavior at 350 and 150 MHz and the new frequency will further probe the erratic nature of the radio emission. This will allow a comparison with other erratic radio emitters such as radio-emitting magnetars and the so-called Rotating RAdio Transients (RRATs). These observations are important to understand what the total expected population of these sources yet to be discovered might be, and to understand how different pulsar classes are related.