

Title

**Unveiling the nature of white dwarf pulsars with MeerKAT**

Abstract

The discovery of J191213.72-441045.1 (J1912-4410 hereafter) as the second white dwarf pulsar has firmly established white dwarf pulsars in compact binary systems as a separate class of objects, supporting formation models of white dwarf pulsars and offering new insights into the evolution of magnetic cataclysmic variables. J1912-4410 harbours a rapidly rotating magnetic white dwarf with a spin period of 5.30 min in a 4.03-hr compact binary. The radio pulse profile of J1912-4410 is narrow and well-defined, similar to pulse profiles in neutron star pulsars, suggesting a favourable geometry whereby the white dwarf pulses can be seen directly. We propose to monitor J1912-4410 with MeerKAT in fast imaging mode (UHF band, 2-second time resolution) and fast timing mode (PTUSE) to study the nature of pulsed radio emission in white dwarf pulsars in unprecedented detail and to track the spin evolution of J1912-4410. In addition, we aim to potentially double the number of known white dwarf pulsars by observing two white dwarf pulsar candidates, one in a binary system similar to AR Sco and J1912-4410, and one in a nearby, isolated and strongly magnetic white dwarf.