

MeerKAT Observations of White Dwarf Pulsars

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White dwarf radio pulsars (WD pulsars) are a fascinating, newly established class of compact binary systems. To date, only three have been confirmed: AR Sco, J1912–4410 and J2306+2440. Like their neutron star counterparts, they exhibit radio pulsations driven by rapid rotation and intense magnetic fields. Since its discovery in 2016, AR Sco has spurred significant debate regarding the nature and origin of WD pulsars, particularly the formation of their strong magnetic fields. These discussions yielded exciting and promising results, but the recent confirmation of J1912–4410 now challenges these prevailing formation scenarios, revealing shortcomings that observations from AR Sco alone could not expose. As such, J1912–4410 offers a crucial opportunity to refine our understanding not only of WD pulsar formation but also of their place in the broader context of magnetic cataclysmic variable (mCV) evolution. Here, I demonstrate how MeerKAT's exceptional 2-second timing resolution provides a uniquely powerful means of probing these systems. Its ability to capture fine temporal structure at a wide variety of radio frequencies allows us to place constraints on WD pulsar models.

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