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A mechanism for coherent radio emission from ultra-long period magnetars

Tuesday, 9 July 2024 15:25 (25 minutes)

The nature of recently discovered ultra-long period radio transients is uncertain. If these sources are neutron stars, their long periods strongly challenge rotation-powered emission models. In this talk, I will present a new model of radio emission from ultra-long period magnetars, in which crustal stresses power magnetospheric twists, which dissipate to produce coherent radio emission. I will introduce the possible driving forces behind emission including: plastic flow, thermoelectric gradients and past starquakes, and discuss how twist-generated curvature or inverse-Compton scattered photons may naturally reproduce the observed properties of known sources. I will detail our predictions of the pulse profiles and multi-wavelength counterparts of these long period radio transients. I will conclude by discussing new theoretical deathlines and 'active zones', in which more long period sources could be discovered.

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