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Evidence of vacuum birefringence from the polarisation of the optical emission of an Isolated Neutron Star

Friday 19 May 2017 12:00 (20 minutes)

RX J1856.5-3754 is a radio-quiet Isolated Neutron Stars (INSs) discovered in the soft X-rays through its purely thermal surface emission. Owing to its large inferred magnetic field of ~1013 G, radiation from its surface is expected to be substantially polarised, independently on the mechanism actually responsible for the thermal emission. A large observed polarisation degree is, however, expected only if quantum-electrodynamics (QED) polarisation effects are present in the magnetised vacuum around the star. In this talk, I will report on the measurement of optical linear polarisation for RX J1856.5-3754 (V~25.5) with the Very Large Telescope. We measured a polarisation degree P.D.=16.43%±5.26%, large enough to support the presence of vacuum birefringence, as predicted by QED.

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