



Contribution ID: 132

Type: Poster

A model for distortions of polarisation angle in radio pulsars

Tuesday 15 December 2015 15:42 (3 minutes)

Average profiles of some radio pulsars contain weak emission components which cover large intervals of pulse phase as well as localised emission or absorption features. The polarisation-angle (PA) under such features exhibits local distortions which cannot be explained through the rotating vector model and other effects such as the special relativistic effects or modification of magnetic fields. We show that some of these distortions in the average PA curve can be explained using a simplified physical model of an extended microbeam of the X-mode curvature radiation. Successful interpretation will be presented for features with very different polarisation characteristics, such as the bifurcated emission component on the trailing side of the profile of J0437-4715, and for the double notches observed in B1821-24A and J0437-4715.

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Session Classification: 18 - Gal. accel. & pulsars