

# PHAROS Conference 2019: the multi-messenger physics and astrophysics of neutron stars



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## Coherent polarisation effects in radio pulsars

Observed radio pulsar polarization exhibits a range of complicated phenomena which cannot be explained by the rotating vector model. These include strong distortions of a polarization angle curve and high levels of circular polarization  $V$ . Properties of the circular polarization are quite peculiar:  $V$  tends to peak in coincidence with orthogonal mode transitions, and can have both signs within the same (single) orthogonal polarization mode. All these properties can be interpreted in terms of empirical model in which the observed polarization results from coherent addition of orthogonal polarization modes. The main model parameter is the relative phase lag and the amplitude ratio of the interacting modal waves. I will show what are the model's generic predictions for the pulsar polarization, and how these results compare with the well-known observations of complex pulsar polarization, e.g. the core-component polarization of B1237+25.

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