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Abstract:

Radio pulsars are known to exhibit rich emission phenomena, such as profile mode-changing and shifting, periodic and non-periodic pulse nulling and regular and irregular sub-pulse drifting. However, rarely do we find a single pulsar that exhibits multiple phenomena. These pulsars are unique for a coherent study that unites several different emission features, thus forming a bridge to link the different pulsar emission mechanisms. All the pulsars in this proposal show such behaviour. We plan to examine their emission variabilities, such as the changes in the different polarization details, in relation to the different emission features. Modeling will be developed to explain the different phenomena as a whole, and how understanding these phenomena can add new information to pulsar emission physics.