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Abstract:

Periodical amplitude modulation is a rare phenomenon in pulsars, in which pulses only show periodic intensity modulations that do not propagate in pulse phase. The physics origin of them is still unclear. The emission of most pulsars with periodical amplitude modulation is weak and current observations are insufficient to distinguish the weak and bright pulses of this phenomenon because of the limited S/N. In this proposal, we aim to observe pulsars with periodical amplitude modulation phenomena using FAST. The highly sensitive observation with FAST will enable us to study this phenomenon on single pulse. We will distinguish the bright and weak pulses, and then analyze the polarization profiles of them, which can help us to understand the physical origin. We will also compare the difference between the periodical amplitude modulation and the periodical mode changing/nulling. We will also analyze the jitter noise of these pulsars and examine the achievable timing precision by only using the bright pulses. Our highly sensitive observations is important to understand the periodical amplitude modulation phenomenon of pulsars.