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Assessing orbital parameters of binary pulsars produced by kick velocity

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This paper studies the formation of Millisecond Pulsars (MSPs) and the dynamical characterisation of their parameters with a distribution of long (Porb > 2d) circular (e \leq 0.1) orbits. For this task, a distinct approach to the analysis of the orbital parameters of binary MSPs (in Galactic disk and globular cluster) produced by the asymmetric kick imparted during the Accretion Induced Collapse (AIC) of white dwarfs process. It turns out that the distribution of binary pulsar orbits peaks up to Por_b; f \leq 90 d with strong circularisation of the orbits. Considering the different assumptions about the distribution of companion stars $3M\boxtimes \leq M_{com} \leq 7M\boxtimes$, the binary will affect toward setups of the balance condition of minimum energy. As a result, this would lead to contribute significantly to their distributions of orbital parameters. In addition, the binary evolution leading to AIC kicks is critically dependent on the inclusion of ratio of the \neta = v_kick v_esc. We demonstrate that when \neta \geq 0.35, the kick velocity has very significant constraints and govern the dynamical effect on the orbital parameters. We indicate specific pulsar systems with orbital parameters where the results of this work are relevant to AIC-candidates.

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