

THE KINEMATIC PROPERTIES OF TWO PULSAR TYPES

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The two types of pulsars are different from each other in many aspects. It may imply that they may have different progenitors. The kinematic

analysis can give us some clues to the properties of these progenitors. We have analysed the distributions of two types of pulsars with their distances  $|z|$  from the galactic plane vs. their true ages

Type I:

$$T_I = \frac{(1+5P^3)}{3 \cdot 5^{2/3} P^3} \left[ \frac{1}{2} \ln \left( \frac{5^{2/3} P^2 - 5^{1/3} P + 1}{(5^{1/3} P + 1)^2} + 3^{1/2} \left( \operatorname{tg}^{-1} \frac{2 \cdot 5^{1/3} P + 1}{3^{1/2}} + \frac{\pi}{6} \right) \right] \right.$$

Type II:

$$T_{II} = \frac{\tau_D}{2} \ln \left( \frac{P}{\tau_D P} + 1 \right).$$

In fig. a) and b), we present plots of  $|z|$  vs.  $T$  for type I and type II pulsars with ages less than  $2 \times 10^7$  yr and the mean kinematic evolutionary tracks for each type, respectively.

The results show that the mean dynamic evolutions corresponding to 40 km/s for type I but 160 km/s for type II pulsars.

Fig. The plots of  $|z|$  vs.  $T$  for a) type I, and b) for type II pulsars. The solid lines are their mean dynamic evolutionary tracks.

