RADIO EMISSION MECHANISMS FOR TWO TYPES OF PULSARS

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We are trying to explore the radio emission mechanisms for our two types of pulsars from fitting the observational (true) age distribution for pulsars within 5 kpc of the sun with the theoretical one:

$$\frac{\mathrm{dN}}{\mathrm{dt}} \propto \frac{\mathrm{L}(\mathrm{t})}{\left|\frac{\mathrm{dL}}{\mathrm{dt}}\right|} \quad \mathrm{R}(\mathrm{L})$$

here L is the radio luminosity of pulsars, $\frac{dL}{dt}$ the luminosity derivative and R the birth rate.

Assuming that the radio luminosity of pulsars is related to P and $\dot{\text{P}}$ with the following fomula

 $L = \alpha P^{a} \dot{P}^{b} (1+5 P^{3})^{c}$

here $\boldsymbol{\alpha}$ is a coefficient, a, b and c are constants to be determined from the fitting.

The results are as follows: for Type I pulsars we should consider both the light cylinder model and the polar cap model, but for Type II pulsars, the only model we should consider is the polar cap model.

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