LETTERS TO THE EDITOR

ON THE NONCONVECTIVE PLASMA BUNCHING IN PULSARS

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It was argued in the Summary of Ref. [1] that the nonconvective plasma bunching cannot be responsible for coherence of single-particle curvature radiation in pulsars. This conclusion was based on the radius-to-frequency map $r \propto \nu_c^{-2}$ (see e.g. [2]), where $\nu_c = (3/2)\gamma^3 c/\varrho$ is the critical frequency of curvature radiation and $\varrho = 4/3\,(r/\sin\vartheta)$ is the radius of curvature of dipolar magnetic field lines. Such a dependence can be obtained for each field line because $\sin\vartheta \propto r^{1/2}$ along it. Since $r(\nu) \propto \nu^{-2p_2}$ and $\nu = \nu_c$ then $p_2 = 1$ and the separation index $p = p_1 \cdot p_2 \geqslant 1$, $(p_1 \geqslant 1)$, in conflict with observations. This leads to the statement from the beginning of this note. However, this conclusion is not correct. For a given phase of the observed pulsar emission the angle ϑ is fixed and the radiation is emitted from different field lines (see e.g. [1]). Thus $\varrho \propto r$ and the radius-to-frequency map in the form $r \propto \nu_c^{-1}$ should be used. Hence it follows that $p_2 = 1/2$ and $p \geqslant 1/2$. This means that the nonconvective bunching is not excluded as a source of the observed pulsar emission.

REFERENCES

[1] J. Gil, *Acta Phys. Pol.* **B12**, 1081 (1981).
[2] B J. Rickett, J. M. Cordes, Proc. IAU Symp. 95, Pulsars, D. Reidel Publ. 1981.

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