

Drift of HF components in PSR 0531+21 radiation as confirmation of the idea of nonlinear reflection from the surface of neutron star

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20 years later after the detection of the high frequency (HF) components in the radiation of the Crab pulsar by D.Moffet and T.Hankins [1], T.Hankins, G.Jones & J.Eilek returned to observation of these objects at even higher frequencies [2]. The detailed analysis of physical results and problems is discussed in the authors' review [3]. The questions of inter pulse shift and HF components appearance have marked as unresolved. As one of the results, a frequency drift of HF components has been discovered. Emergence of the HF components in the same frequency range, as that in which the inter pulse shift [1] takes place, permits us also to associate these components with reflection [4] from the neutron star surface. (See more detailed examination of the problem with coherence and spectrum discussion in the report of the author and S.V.Trofymenko on this conference [5]). In the non-linear reflection model [6] (which is the model of induced Raman scattering by surface waves), the frequency shift of the HF components appears in the natural way, regardless of the type of surface waves that induce the Raman scattering. It is only important in our consideration that the reflection is associated with "Wood's anomaly" involving the diffraction waves creeping along the star surface. In the previous work [6] we have supposed that different HF components are produced by opposite magnetic poles. The unidirectional drift, that is intrinsic to both components [2], stipulates one to associate them with the single magnetic pole of the star and maybe with the birefringence in the magnetosphere.

References

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