

Amazing properties of giant pulses and the nature of pulsar's radio emission

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ABSTRACT: Vast observations, including polarization measurements, simultaneous multi-frequency, multi-station and also VLBI sessions, were conducted over the last year for detail studying of giant pulses (GPs). First results show a number of new extraordinary very amazing properties, such as: incredible huge flux density of short duration peaks (up to few MegaJy, for the Crab pulsar at 2 GHz); wonderful spectra & spectral features; unusual rapid polarization variations inside the pulses, with the degree up to 100% of linear or/and circular; quite abnormal difference in scattering of RCP & LCP polarized emission, and some others. At first sight it seems they are a set of unconnected, poor understood events. However, assembling together with already known data, they give surprisingly well-consistent physical picture which can clarify many aspects in pulsar's physics. In particular, giant radio pulses may play an important role in particles acceleration and bunching. There is an obvious relation between GPs and high energy pulsed emission. Likely giant pulses are conceived directly in the gap near polar cup during discharge.