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Pulsar radio nanoshots as a low-frequency afterglow of relativistic magnetic reconnection ALEXANDER PHILIPPOV, Flatiron Institute, Center for Computational Astrophysics, DMITRI UZDENSKY, University of Colorado, Boulder, ANATOLY SPITKOVSKY, Princeton University — In this talk we propose that coherent radio emission of young energetic pulsars and some millisecond pulsars is produced in the magnetospheric current sheet. Magnetic reconnection in the pulsar sheet proceeds in the plasmoid-dominated regime. Collisions of plasmoids with each other and with the upstream magnetic field eject fast-magnetosonic waves, which escape from the plasma as electromagnetic waves in radio band. We illustrate this mechanism with first-principles kinetic plasma simulations, which allow us to compute the radiation spectrum. This model explains many features of observed short bursts of radio emission: their phase coincidence with the gamma-ray emission, nano-second duration, and extreme instantaneous brightness.

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