

THE EQUATORIAL CURRENT SHEET IN THE PULSAR MAGNETOSPHERE

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We show that the equatorial current sheet is an integral element of the magnetosphere of a rotating neutron star. Non-dissipative reconnection along this current sheet allows for the continuous channeling of the neutron star spindown energy into particle (electrons and positrons) energy, all the way from the light cylinder to the pulsar wind termination shock. Some accelerated particles may even reach energies up to 10^{16} eV. We argue that one cannot study the current sheet without taking into account the global structure of the magnetosphere, and we propose various observable manifestations of its action.