

Abstract

We present the structure of the 3D ideal MHD pulsar magnetosphere to a radius ten times that of the light cylinder, a distance about an order of magnitude larger than any previous such numerical treatment. Its overall structure exhibits a stable, smooth, well-defined undulating current sheet which approaches the kinematic split monopole solution of Bogovalov 1999 only after a careful introduction of diffusivity even in the highest resolution simulations. It also exhibits an intriguing spiral region at the crossing of two zero charge surfaces on the current sheet, which shows a destabilizing behavior more prominent in higher resolution simulations. We discuss the possibility that this region is physically (and not numerically) unstable. Finally, we present the spiral pulsar antenna radiation pattern.
