A hybrid numerical approach to study relativistic magnetospheres

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Résumé

The study of compact object magnetospheres has developed quickly in recent years thanks to the development of high-performance computing. Two complementary numerical methods have been used to model these objects thus far: the magnetohydrodynamic (MHD) and the particle-in-cell (PIC) techniques. The MHD approach is well-suited to describe the plasma at large scales, while the PIC method is appropriate to capture the microphysics but it is computationally expansive. Our objective is to combine the strengths of both approaches into the same numerical framework. This hybrid method is illustrated here in the case of an aligned pulsar magnetosphere as a preliminary result.

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