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Inclined Pulsar Magnetospheres: Analytic Results at Realistic Compaction, Rotation, and Magnetization. SAMUEL GRALLA, University of Arizona, ALEXANDRU LUPSASCA, Harvard University, ALEXANDER PHILIPPOV, Princeton University — Most previous studies of the pulsar magnetosphere have made three unrealistic assumptions: rapid rotation, pure magnetic dipole, and low stellar compaction (i.e. flat spacetime). We relax all three assumptions with a combined numerical-analytical technique that leverages the rotation rate as a small parameter. We consider a perfectly conducting, nearly spherical star with a force-free magnetosphere. We derive a general approach and then provide definite results for magnetic fields that are symmetric about an axis inclined relative to the rotation axis. We discuss polar cap shapes and pair production regions for a variety of magnetic field configurations. These results are relevant for X-ray pulsations as well as coherent radio emission.

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