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Magnetized Neutron Stars Propagating Through A Non-Uniform ISM

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Many neutron stars propagate through the interstellar medium with supersonic velocities, and their magnetospheres interact with the interstellar medium (ISM), forming bow shocks and magnetotails.

Using numerical MHD simulations, we investigated the propagation of a magnetized neutron stars through a non-uniform ISM, the interaction of the magnetospheres with the ISM and the influence of ISM density on the shape of the magnetosphere tail. We consider the interaction of magnetized neutron stars with small-scale and large-scale inhomogeneities in the ISM. We conclude that the inhomogeneities in the ISM can change the shapes of the bow shocks and magnetotails at different values of the magnetization.

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