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LOCAL EXISTENCE OF CONTACT DISCONTINUITIES IN RELATIVISTIC MAGNETOHYDRODYNAMICS

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We study the free boundary problem for a contact discontinuity for the system of relativistic magnetohydrodynamics. A surface of contact discontinuity is a characteristic of this system with no flow across the discontinuity for which the pressure, the velocity and the magnetic field are continuous whereas the density, the entropy and the temperature may have a jump. For the two-dimensional case, we prove the local-in-time existence in Sobolev spaces of a unique solution of the free boundary problem provided that the Rayleigh–Taylor sign condition on the jump of the normal derivative of the pressure is satisfied at each point of the initial discontinuity.

Key words and phrases: relativistic magnetohydrodynamics, free boundary problem, contact discontinuity, local-in-time existence and uniqueness theorem.

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