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Of the nature of a hot, "strongly-"magnetized plasma state -in thermal equilibrium- in astrophysics DANIEL BERDICHEVSKY, NASA/GSFC — The main outcome of this study of constitutive properties of the medium is the estimation of its magnetic permeability, two orders of magnitude smaller than that of the vacuum, i.e., a highly diamagnetic material. (This diamagnetic property is consistent with the superconductivity assumption in magnetohydrodynamics theory, baseline of any macroscopic-scale description of the interplanetary medium.) We propose that a 3-D amorphous Langmuir lattice state is a good representation of the properties of this class of self-organized magnetized matter in solar transients, coronal mass ejections, containing extremely dilute matter strongly dominated by a magnetic field. We further conjecture that the presented state of magnetized matter could be an adequate representation of the 'local insterstellar medium region,' in which the solar-system as a whole moves, based on current observations by the spacecraft Voyager 1. The presented interpretation benefits from the observation of many strongly magnetized structures ejected by the Sun, in their march through the interplanetary space evolving consistently with a simple 3-D magnetohydrodynamic model representation.[1] Understanding of the magnetized matter state is gained by means of a case study from 3s in-situ magnetic field and plasma observations in space, which will be outlined in the presentation.[2] (These are SWE and MFI instruments data in spacecraft Wind.)

[1]Berdichevsky, D. B., *Sol. Phys.,* DOI 10.1007/s11207-012-0176-5. *Sol. Phys.,* **284**, 245-259, 2013.
[2]Berdichevsky, D. B., and K. Schefers, submitted to *ApJ, 2014.*

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