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Book of Abstracts

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- Fundamental Problems of Magnetohydrodynamics
- Astrophysical and Geophysical Magnetohydrodynamics
- Applied Magnetohydrodynamics
- Magnetic Fluids and Their Applications
- Soft Magnetic Matter and its Application-Oriented Aspects
- Heat and Mass Transfer in Liquid Metals (with and without magnetic field)

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THE MAGNETIC HELICITY AND HIGHER HELICITY INVARIANTS AS CONSTRAINTS FOR DYNAMO ACTION

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It is known by the Arnold's Theorem that the magnetic helicity is not only an invariant in an ideal MHD, but also admits a gauge-invariant density [1], [2]. We will consider a question: «Is it possible to achieve an exponent -1.7 for a turbulent spectrum of the magnetic energy?» We get an affirmative answer, assuming that quasi-periodic magnetic fields are distributed free over the scale. Our answer uses asymptotic Hopf invariants [3], and the M-invariant [4] (a numerical measure of knottiness of magnetic lines).

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