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Non-symmetric closed line vacuum magnetic fields and MHD equilibria in a topological torus[1] HAROLD WEITZNER, WRICK SENGUPTA, Courant Institute of Mathematical Sciences, NYU — Non-symmetric vacuum magnetic fields with closed magnetic field lines are of interest in the development of stellarator equilibria. After the early results of D.Lortz [1], there have been few advances. This work presents a closed form expression for a class of vacuum magnetic fields with closed magnetic lines in a topological torus. For one particular simple example for this class, we find the field invariants, and we show that an extension of the Lortz analysis allows the construction of ideal MHD equilibria by a convergent expansion in plasma beta. [1] Lortz, D. (1970) ZAMP, 21(2), 196-211.

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