On magnetoviscoelastic fluids in 3D

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I will introduce a thermodynamically consistent model for a magnetoviscoelastic fluid in 3D. Existence, uniqueness, and asymptotic behavior of strong solutions is studied in the framework of quasilinear parabolic systems and maximal regularity in L_p-spaces. It will be shown that the critical points of the entropy functional with prescribed energy correspond exactly to the equilibria of the system. Constant equilibria are normally stable: solutions that start close to a constant equilibrium exist globally and converge exponentially fast to a (possibly different) constant equilibrium. Moreover, it will be shown that the negative entropy serves as a strict Lyapunov functional and that every solution that is eventually bounded in the topology of the natural state space exists globally and converges to the set of equilibria.