Theory for relaxed plasma states with pressure gradient JINLIN XIE, USTC, HONG QIN, USTC and PPPL, WANDONG LIU, USTC, YAO ZHOU, CHANG LIU, PPPL — In the Taylor-Woltjer theory for relaxed plasma states, the pressure gradient vanishes. This is because only one global constrain, i.e., the global helicity, is applied in the minimization procedure for the energy. However, for experimental studies of self-organized, relaxed plasma states in reverse field pinch devices, the pressure gradient always exists. Applying a set of more realistic constrains, such as the local mass conservation and vorticity conservation during the minimization procedure for the energy, we have developed a new theory for relaxed plasma states which allows more interesting structures, including the pressure gradient.

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