AVERAGED DESCRIPTION OF 3D MHD EQUILIBRIUM *

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A general approach by S. A. Galkin et al. in 1991 to 2D description of MHD equilibrium and stability in 3D systems was proposed. The method requires a background 3D equilibrium with nested flux surfaces to generate the metric of a Riemannian space in which the background equilibrium is described by the 2D equation of Grad-Shafranov type. The equation can be solved then varying plasma profiles and shape to get approximate 3D equilibria. In the framework of the method both planar axis conventional stellarators and configurations with spatial magnetic axis can be studied. In the present report the formulation and numerical realization of the equilibrium problem for stellarators with planar axis is reviewed. The input background equilibria with nested flux surfaces are taken from vacuum magnetic field approximately described by analytic scalar potential.