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Axisymmetric equilibria with anisotropic resistivity and toroidal flow[1] GEORGE POULIPOULIS, GEORGE THROUMOULOPOULOS[2], University of Ioannina, Association Euratom-Hellenic Republic, Section of Theoretical Physics, GR 451 10 Ioannina, Greece, HENRI TASSO, Max-Planck Institute for Plasmaphysics, Euratom Association, D-85748 Garching, Germany — The equilibrium of an axisymmetric magnetically confined plasma with anisotropic resistivity and toroidal flow is investigated in the framework of MHD. The stationary states are determined by an elliptic differential equation for the poloidal magnetic flux function, a Bernoulli equation for the pressure and two relations for the resistivity components parallel and perpendicular to the magnetic field. The flow can affect the equilibrium properties solely in the presence of toroidicity because in the limit of infinite aspect ratio the axial velocity does not appear in the equilibrium equations. The equilibrium characteristics of a tokamak with rectangular cross-section are studied by means of eigenfunctions in connection with exact solutions for the cases of "compressible" flows with constant temperature but varying density on magnetic surfaces and incompressible ones. The impact of the flow and the aspect ratio on the resistivity components, electric field and toroidal current density is evaluated.

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