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Characteristics of perpendicular linear wires in magnetoplasma ANDREY YATSENKO, NIKOLAY GOROBETS, Karazin Kharkiv National University — Let's consider plasma, which is in a strong magnetic field. In this case the permittivity of plasma is described by diagonal tensor $\widehat{\varepsilon}$ with components $\varepsilon_{xx} = \varepsilon_{yy} = \varepsilon_1$, $\varepsilon_{zz} = \varepsilon_3$, $\varepsilon_{ij} = 0$, if $i \neq j$, where $\varepsilon_1 = 1 - \omega_N^2/(\omega^2 - \omega_B^2)$; $\varepsilon_3 = 1 - \omega_N^2/\omega^2$; ω_N is the Lengmur's frequency; ω_B is the Larmor's frequency; ω is the working frequency. The magnetic field is directed along axis OZ (anisotropy axis). In such plasma two thin mutually perpendicular wires of any length are located; the wires are not crossed. It is necessary to define the influence of anisotropy on the current distribution in each wire. This problem is solved by a method of the integral equations of electrodynamics. The system of the integral equations for currents is solved by a method of averaging. Is shown, that the period distribution of a current in each wire is determined by equivalent permittivity $\varepsilon_{eq}(\gamma) = \delta^2 \cos^2\gamma + \delta\sqrt{\varepsilon_1}\sin^2\gamma$, where $\delta^2 = \varepsilon_3 \sin^2\gamma + \varepsilon_1 \cos^2\gamma$, γ is angle between an axis of the first wire and anisotropy axis. Parameter $\varepsilon_{eq}(\gamma)$ is various for each wire, as it is determined not only by permittivity of plasma, but also orientation of in plasma. Thus, the current distribution in wires is established such, as though they work in various mediums. The received result can be used for plasma diagnostics.

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