ON MHD OSCILLATIONS OF A FINITE CONDUCTIVITY PLASMA COLUMN IN THE PRESENCE OF A JUMP OF PARAMETERS IN THE NEAR-WALL REGION [[1]](#footnote-1)\*)

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MHD oscillations of a plasma column of finite conductivity are considered in a cylinder model with a strong longitudinal magnetic field [1, 2]. At high but finite conductivity along the magnetic field and at smooth profiles of unperturbed quantities, there are two radial scales in equations of oscillations: the column radius a and the length . Radial eigen functions include, generally speaking, large-scale and small-scale components, and large-scale solutions differ little from those in ideal MHD (). For the given wave numbers *m* and *n*, the significant small-scale part can be localized near the resonant magnetic surface , provided such a surface exists in the plasma; this part is important e.g. in tearing mode. In this work, we study the situation when the resonance is absent. But we assume that there is a periphery magnetic surface near which the unperturbed quantities change essentially (have a "jump") at a transition layer thickness of . Two cases are described: a - the small-scale component of the perturbation vector-potential, , is comparable with large-scale one, ; b - .

References

1. *B.B. Kadomtsev and O.P. Pogutse*, in Reviws of Plasma Physics, Ed. by M.A. Leontovich (Consultants Bureau, New York, 1970; Atomizdat, Moscow, 1967), Vol. 5, p. 249.
2. *P.H. Rutherford, H.P. Furth, and M.N. Rosenbluth*, in Proceedings of the 4th IAEA Conference on Plasma Physics and Controlled Nuclear Fusion Research, Madison, 1971 (IAEA, Vienna, 1971), Vol. 2, p. 553.
1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVII/Mu/ru/BH-Arsenin.docx) [↑](#footnote-ref-1)