

THE VORTEX FORMATION IN A HORIZONTAL FINITE CYLINDER BY ALTERNATING ELECTRIC CURRENT

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The distribution of electromagnetic fields and forces induced by a three phase axially-symmetric system of electrical current in a horizontal cylinder of finite length has been investigated and calculated [1]. The alternating current is fed to every of 9 discrete circular conductors-electrodes, which are placed on the internal wall of the cylinder.

The viscous incompressible flow of electroconductive liquid-electrolyte are obtained by the finite-difference method, using the monotonous vector schemes.

The average axially-symmetric motion of electrolyte and vortex distribution in a cylinder has been obtained in dependence of electromagnetic forces and of velocity distribution at the inlet of the cylinder:

1. The vortex formation from the Lorentz forces inside the cylinder by the electrode,
2. The vortex-breakdown formation from the swirl velocity at the inlet of the cylinder.

The distribution of vortex is essentially depending of the connection from electrode.

REFERENCES

- [1] A. Buikis and H. Kalis. Flow and temperature calculations of electrolyte for a finite cylinder in the alternating field of finite number circular wires. *Magnetohydrodynamics*, **40** (1), 2004, 77 - 90.