PONDEROMOTIVE ACTION OF THE VECTOR POTENTIAL

(one-line space)

A.Kabychenkov

(one-line space)

Institute of Radioengineering and Electronics of RAS/ Vvedenskogo1, Fryazino, Moscow region, Russia, 141190/ akab@mail.cplire.ru

(one-line space)

A symmetric closed magnetic circuit, placed along the axis of the cupper ring with sliding contacts is rotated, when the current flows through the contacts. The ponderomotive action may be explained by the interaction of the electric current and the magnetic vector potential **A** induced by the magnetization. Within the framework of the classical electrodynamics it is shown, that an elementary volume is exposed along with magneto-dipole moment the moment of force $\mathbf{N}^A=c^{-1}[\mathbf{J}^{eff}\mathbf{A}]$, where c is the light velocity, $\mathbf{J}^{eff}$ is the effective current density. The moment $\mathbf{N}^A$ is similar to the moment of force [**vp**] into the equation of dynamic of the orbital angular momentum $d\mathbf{L}/dt=[\mathbf{vp}]+\mathbf{N}$. The vector **A**/c is considered as potential impulse of an electromagnetic field per unit of charge. The reality of the **A** is evident from Aaronov-Bom effect. The volume integration of the N^A_z gives us the total moment of force which acting on the ring from magnetic circuit $N^A_z=(\Phi J_0/2\pi c)F$, where Φ is the magnetic flux, J_0 is the total current into the semiring. The function F is determined by geometric of the motor. Using tipical magnitudes of the parameters one obtains $(N^A_z)_{max}/J_0\approx 135$dyne-cm/A. The numerical values of the $(N^A_z)_{max}$ are corresponded to the experimental values. Furthermore the theoretical angular dependence of the relative moment of force quality describes experimental dependence.

abstract category 8
poster