Emittance Growth of a Beam owing to Coulomb Interaction of Charged Particles Moving through a Drift Path, M. DREVAL, <u>V.M. KHORUZHIY</u>, Kharkov Inst. of Physics & Technology - We theoretically investigated a drift of charged particle beam with current I, normalized emittance E_n, Coulomb potential U, radius R, initial "temperature" T_0 [1] and particle charge q. We obtained the analitical expression for a beam emittance growth $E_n/E_{n0} = (1 + qU/2\ T_0\ \gamma^2)^{1/2}$. Another form of the expression is $E_n/E_{n0} = \{1 + \alpha\ I\}^{1/2}$ for homogeneous density of a beam. The characteristic length of a drift for a beam emittance growth is $\Delta z_0 = R\ \beta\gamma/2\ (m_0\ c^2\ \gamma/2qU)^{1/2}$. Emittance growth of an intensive beam is considerable value for $\Delta z > \Delta z_0$.

[1] Lawson J.D., The physics of charged-particle beams. Clarendon Press, Oxford, 1977 (in Russian: Publishing House "MIR", Moscow,1980, p.206)