at the moving contacts. The measurement can be obtained with the aid of a ballistic galvanometer and amplifier. With the estimated magnitudes above, this apparatus ought to give the value of e/m for conduction electrons with an error not exceeding 1%.

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The Radiation of a Rapidly Moving Electric Image of a Uniformly Moving Charge

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OF the wide class of problems on radiation effects accompanying the rapid passage of charges near conducting or dielectric surfaces of given arbitrary form, we consider the simplest concrete example: the calculation of the radiation caused by the change of the image of a charge with non-relativistic but sufficiently large velocity falling upon a conducting sphere of radius R. In the non-relativistic case we can employ certain formulas of electrostatics connected with the magnitude and coordinates of the inducing charge and the image charges: $x_1 x_0 = R^2$; $e_1 = -e_0 R/x_0 = -e_2$; $x_2 = 0$ (origin of coordinates measured from the center of the sphere, and the zero subscript denoting quantities relating to the inducing charge).

The dipole moment of the image charge is equal to the induced dipole moment of the sphere $p = e_1 x_1 = e_0 R^3 / x_0^2$, and has a second derivative with respect to time, different from zero even for $\dot{x}_0 = -\beta_0 c = \text{const}$. The total energy radiated for the change of dipole moment, due to the motion of the inducing change from infinity to the surface of the sphere, is

$$\Delta\mathcal{E} = \frac{2}{3c^3}\int \ddot{p}^2 dt = \frac{24}{7}\frac{e_0^2}{R}\beta_0^3.$$

Such energy of the first burst of radiation precedes the radiation of the transient decelerating source (concerning transient radiation for a plane boundary, see references 1 and 2). We compare the received radiation of the image with the radiation of a charge in complete braking in the electric field of a parallel plate condenser. For the path of charge parallel to the field

$$\delta\mathcal{E} = \frac{2}{3}\frac{e_0^3 E\beta_0}{m_0 c^2},$$

$$\frac{\Delta\mathcal{E}}{\delta\mathcal{E}} = \frac{36}{7}\frac{m_0 c^2\beta_0^2}{e_0 ER} = \frac{72}{7}\frac{\mathcal{E}_{\text{kin}}}{e_0 ER};$$

for $eER = \mathcal{E}_{\text{kin}}$; $\Delta\mathcal{E} \simeq 10\,\delta\mathcal{E}$.

It is evident that by suitable choice of the form (concave or convex) of the conducting surface, an accelerated or "super light" collapse of the field can be realized, redistributing the charge, even for a constant velocity of motion of the inducing charge (not exceeding that of light).

The employment of a bunch of charged particles as an inducing charge can increase the radiation effect by many orders of magnitude.[3] This justifies the interest in the study of the potentialities of transformation of the velocities and accelerations of image charges, and in the investigation of annihilation radiation associated with the uniting of the bunch with the induced charge.

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On the Problem of Rotational Levels and the Spectra of Heavy Nuclei. II

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IN the present communication, calculations concerning the relative intensities of α-particle groups from RdAc → AcX, based on the model of nuclear rotators[1], are presented, and are compared with experimental data[2,3]. The quantum-mechanical theory of α-decay, presented in