The critical current, for the case of zero initial velocity, is not achieved under the space charge limited condition of zero surface electric field whenever the magnetic field $B > B_H$, the Hull cutoff value. Thus Eq. (3) in Ref. 1, which is derived under the assumption of zero surface electric field, is not the critical current. However, it deviates from the correct critical current only by a small amount, so that it still serves as a useful estimate (see Fig. 1 of this Erratum). The correct value of the critical current does not have a closed form solution for $B > B_H$. For small initial velocity $u_0$, it is given by the following equations:

$$\bar{V} = \bar{J}^2 \bar{T} \left[ 4 \tan(\bar{T}/2) - 2 \bar{T} \right] + 2 \bar{J} \left[ \bar{T} - \tan(\bar{T}/2) \right]$$

$$+ \bar{u}_0 \left[ \bar{T} \cot(\bar{T}) - 1 \right] - \bar{u}_0 \cot(\bar{T})$$

$$0 = 4 \bar{J}^2 - \bar{T} \cos(\bar{T}) \cos(\bar{T}) \left[ 1 + \cos(\bar{T}) \right] + 2 \bar{J} \left[ \bar{T} \left[ \cos(\bar{T}) \sin(\bar{T}) - \bar{T} \right] + \bar{u}_0 \sin^2(\bar{T}) \right]$$

$$+ \bar{u}_0 \sin^2(\bar{T})$$

where $\bar{u}_0 = u_0 / \Omega D$ and the same notations as in Ref. 1 have been used. These two equations determine the critical current $J_c$ in terms of $\bar{V}$, with $\bar{T}$ as a running parameter. The correct value of $J_c$, according to these two equations, is shown in Fig. 1, where the previous result based on the space charge limited condition (Fig. 1 of Ref. 1) is also shown for comparison.

The critical current, for the case of zero emission velocity, is indeed achieved under the space charge limited condition if $B < B_H$. The rest of Ref. 1 remains valid. The details are given in Ref. 2.