Science & Technology Facilities Council

Longitudinal space charge

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Longitudinal space charge

Is this explain the reduction of effective RF voltage?

$$E_s = -e\left(\frac{g_0}{4\pi\epsilon_0\gamma^2} - \frac{\beta^2 c^2 L}{2\pi R}\right)\frac{\partial\lambda}{\partial s}$$

No idea on the inductive part (Question 1).

When $\dfrac{\partial\lambda}{\partial s} = 10^{10}$ (Question 2)

$$E_s = 34\ \mathrm{V/m}$$

Where $b/a = 2$ gives $g_0 = 2.4$