iv) $\lambda' = \frac{Q}{L}$.

also $\lambda' = 2\pi\varepsilon_0 d|E'|$ for rest charge observed in S'

In S, $L_S = L\sqrt{1-v^2/c^2}$

$$\lambda_S = \frac{Q}{L_S} = \frac{Q}{\sqrt{1-v^2/c^2}}$$

Assuming charge invariance between inertial frames under Lorentz transformation.

4