2.9. The nanotransistor

\[ U = U_0 (N - N_0) + qV_G + qV \]  

(A)

\[ N = \int_{-\infty}^{+\infty} dE \, D(E) \, f_1(E) + f_2(E) \]  

\[ I = \frac{1}{q} \int_{-\infty}^{+\infty} dE \, G(E - U) \left( f_1(E) - f_2(E) \right) \]  

(B)

(C)

The plots C1, C1', C2, C2' for current versus (drain) voltage were obtained by solving Eqs.(A,B,C), with all the same parameters, except possibly for \( U_0 \) and \( a \).

2.9a. Compared to plot C1, plot C2 must have used

(a) a higher value of \( U_0 \)
(b) a lower value of \( U_0 \)
(c) a higher value of
(d) a lower value of
(e) none of the above options

2.9b. Compared to plot C1, plot C1' must have used

(a) a higher value of \( U_0 \)
(b) a lower value of \( U_0 \)
(c) a higher value of
(d) a lower value of
(e) none of the above options