

Exercise 31

Solve the telegraph equation in Exercise 29 with $V(x, 0) = 0 = V_t(x, 0)$ for the Heaviside distortionless cable ($\frac{R}{L} = \frac{G}{C} = \text{const.} = k$) with the boundary data $V(0, t) = V_0 f(t)$ and $V(x, t) \rightarrow 0$ as $x \rightarrow \infty$ for $t > 0$, where V_0 is constant and $f(t)$ is an arbitrary function of t . Explain the physical significance of the solution.