```
%Constant current behaviour using TLM
clear

Cur = 1e-3;                     %setting the value of the constant current
Ra = 1000;                      %setting components of R and C in two parallel arms
Rb = 2000;
Ca = 1e-6;
Cb = 1e-7;

delta_t = 1e-8;                 %time-step discretisation
N = 100000;                     %maximum number of iterations
Time = zeros(1,N) ;             %initialisation of time (x-axis) matrix

Za = delta_t/Ca;                % A capacitor is approximated by an open-circuit transmission line
Zb = delta_t/Cb;                % true only at low-frequency limit. So we use very small delta_t


Ia = 0;                         %initialisation of all variables
Ib = 0;
VCa = 0;
VCb = 0;
via = 0;
vib = 0;
vsa = 0;
vsb = 0;
Vs = zeros(1,N);
Vs(1) = 1e-6;                   %setting an initial source voltage to get started


for k = 1:N    %start of TLM iterative loop
        Time(1,k) = k*delta_t;
        Vs(1,k) = (Ra*Rb+Ra*Zb+Za*Rb+Za*Zb)/(Rb+Zb+Ra+Za)*Cur+(2*via*Rb+2*via*Zb+2*vib*Ra+2*vib*Za)/(Rb+Zb+Ra+Za);
                                %driving potential expressed in terms of all other parameters
                                %this is used to calculate the currents in the two arms (below)
        Ia = (Vs(1,k) - 2*via)/(Ra + Za);
        Ib = (1e-6) - Ia;       %current in arm 'b' is total current minus current in arm 'a'

        VCa = 2*via + Ia;       %voltage across capacitor terminals
        VCb = 2*vib + Ib;       % which is also sum of incident and scattered pulses
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        vsa = VCa - via;                %scatter steps
        vsb = VCb - vib;                %scattered pulse is terminal voltage minus incident pulse

        via = vsa      ;                %connect steps.  Pulse scattered from terminal at time k
        vib = vsb;                      % hits open circuit line termination and returns as incident pulse at time k+1
end                                     %end of TLM iterative loop

plot(Time,Vs,'r')
```