a) Sprungantwort der realen angepassten verzerrenden Leitung nach dem numerischen Talbot-Verfahren
b) Rechteckimpuls auf der realen angepassten verzerrenden Leitung nach dem numerischen Talbot-Verfahren
150*Rs/Gs=Ls/Cs
jeweils der Graph mit den Lösungspunkten und der Graph als kubischer Spline

In[1]:=
```
Z0 = 50; Z1 = 50; Z2 = 50; l = 100; x = 100; Cs = 101.054987*^-12; Rs = 6.5616797*^-3; tr = 1*^-7;
Ls = Z0^2 * Cs;
Gs = 150 * Rs * Cs / Ls;
td = x * Sqrt[Ls * Cs];
        Quadratwurzel
Talbot[Fs_, t_, N1_] := Module[{h, shift, ans, theta, k, z, dz},
                        Modul
  h = 2 * Pi / N1;
       Kreiszahl π
  shift = 0;
  ans = 0;
  For[k = 0, k <= N1, k++,
  For–Schleife
   theta = -Pi + (k + 1 / 2) * h;
            Kreiszahl π
   z = shift + N1 / t * (0.5017 * theta * Cot[0.6407 * theta] - 0.6122 + 0.2645 * I * theta);
                                       Kotangens                imaginäre Einheit I
   dz = N1 / t * (-0.5017 * 0.6407 * theta / Sin[0.6407 * theta]^2 + 0.5017 * Cot[0.6407 * theta] + 0.2645 * I);
                                       Sinus                Kotangens                imaginäre Einheit I
   ans = ans + Exp[z * t] * Fs[z] * dz;];
              Exponentialfunktion
  Re[h / (2 * I * Pi) * ans]]
  Realteil  ···  Kreiszahl π

lap[p_] := 1 / p * (Z2 * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (l - x)] + Z0 * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (l - x)]) /
                    Kos···  Quadratwurzel                    Sinu··  Quadratwurzel
     ((Z1 + Z2) * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * l] + (Z0 + Z1 * Z2 / Z0) * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * l]);
                 Kos···  Quadratwurzel                    Sinu··  Quadratwurzel
M = 200; Talits = 220;
Liste = Table[{5 * td / M * i, Talbot[lap, 5 * td / M * i, Talits]}, {i, 1, M}];
        Tabelle
ListPlot[Liste, PlotRange → All, GridLines → Automatic]
listenbezogene Gr···  Koordinatenb···  alle  Gitternetzlinien  automatisch
```

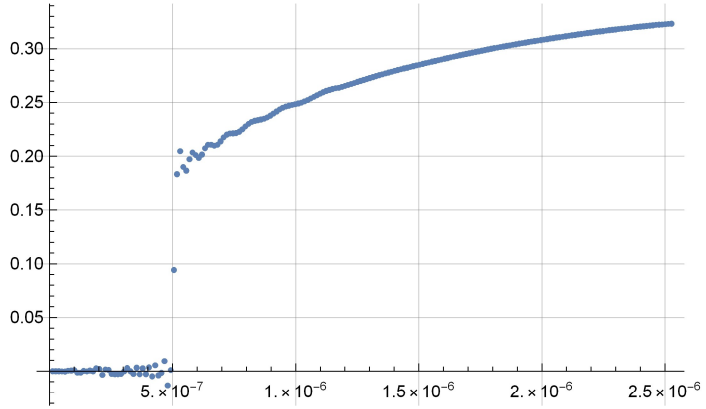
General: $(-4.00102\times10^{-8} + 3.84087\times10^{-8}\,i)\,(-9.49999\times10^{-301} + 5.97366\times10^{-301}\,i)$ is too small to represent as a normalized machine number; precision may be lost.

General: (50. + 0. i) (−5.22551214514422 × 10^{-318} + 4.12964758271442 × 10^{-317} i) is too small to represent as a normalized machine number; precision may be lost.

General: (50. + 0. i) (−5.22551214514422 × 10^{-318} − 4.12964758271442 × 10^{-317} i) is too small to represent as a normalized machine number; precision may be lost.

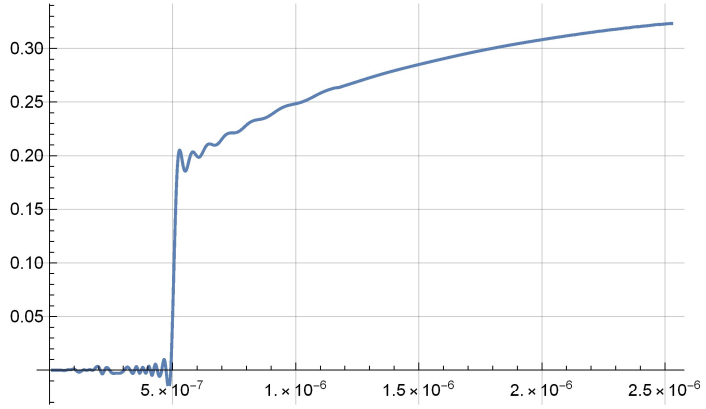
General: Further output of General::munfl will be suppressed during this calculation.

Out[9]=



In[10]:=
```
ListLinePlot[Liste, InterpolationOrder → 3, PlotRange → All, GridLines → Automatic]
```
listenbezogene Liniengra··· | Ordnung der Interpolation | Koordinatenb··· | alle | Gitternetzlinien | automatisch

Out[10]=



In[11]:=

In[12]:=
```
lap[p_] := 1 / p * (1 - Exp[-tr * p]) *
                    Exponentialfunktion
    (Z2 * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (l - x)] + Z0 * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (l - x)]) /
      Kos··· Quadratwurzel                                    Sinu·· Quadratwurzel
     ((Z1 + Z2) * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * l] + (Z0 + Z1 * Z2 / Z0) * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * l]);
       Kos··· Quadratwurzel                                          Sinu·· Quadratwurzel
M = 400; Talits = 220;
Liste = Table[{5 * td / M * i, Talbot[lap, 5 * td / M * i, Talits]}, {i, 1, M}];
        Tabelle
ListPlot[Liste, PlotRange → All, GridLines → Automatic]
listenbezogene Gr··· Koordinatenb··· alle Gitternetzlinien automatisch
ListLinePlot[Liste, InterpolationOrder → 3, PlotRange → All, GridLines → Automatic]
                    Ordnung der Interpolation  Koordinatenb··· alle Gitternetzlinien automatisch
```

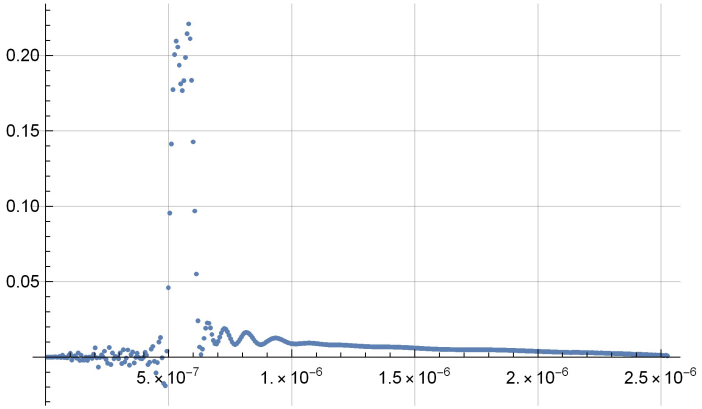
General: $(50. + 0.\,i)\,(-5.22551214514422 \times 10^{-318} + 4.12964758271442 \times 10^{-317}\,i)$ is too small to represent as a normalized machine number; precision may be lost.

General: $(50. + 0.\,i)\,(-5.22551214514422 \times 10^{-318} - 4.12964758271442 \times 10^{-317}\,i)$ is too small to represent as a normalized machine number; precision may be lost.

General: $(2.10703 \times 10^{-10} + 3.3139 \times 10^{-10}\,i)\,(9.89141 \times 10^{-302} - 2.65717 \times 10^{-301}\,i)$ is too small to represent as a normalized machine number; precision may be lost.

General: Further output of General::munfl will be suppressed during this calculation.

Out[15]=



Out[16]=