

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

$$150 \cdot R_s / G_s = L_s / C_s$$

jeweils der Graph mit den Lösungspunkten und der Graph als kubischer Spline

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In[17]:= Z0 = 50; Z1 = 50; Z2 = 100; l = 100; x = 50; 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];
Talbot[Fs_, t_, N1_] := Module[{h, shift, ans, theta, k, z, dz},

  h = 2 * Pi / N1;
  shift = 0;
  ans = 0;
  For[k = 0, k <= N1, k++,
    theta = -Pi + (k + 1 / 2) * h;
    z = shift + N1 / t * (0.5017 * theta * Cot[0.6407 * theta] - 0.6122 + 0.2645 * I * theta);
    dz = N1 / t * (-0.5017 * 0.6407 * theta / Sin[0.6407 * theta]^2 + 0.5017 * Cot[0.6407 * theta] + 0.2645 * I);
    ans = ans + Exp[z * t] * Fs[z] * dz;
  ]
  Re[h / (2 * I * Pi) * ans]

lap[p_] := 1 / p * (Z2 * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (1 - x)] + Z0 * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (1 - x)]) /
  ((Z1 + Z2) * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * 1] + (Z0 + Z1 * Z2 / Z0) * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * 1]);
M = 200; Talits = 220;
Liste = Table[{5 * td / M * i, Talbot[lap, 5 * td / M * i, Talits]}, {i, 1, M}];
ListPlot[Liste, PlotRange -> All, GridLines -> Automatic]

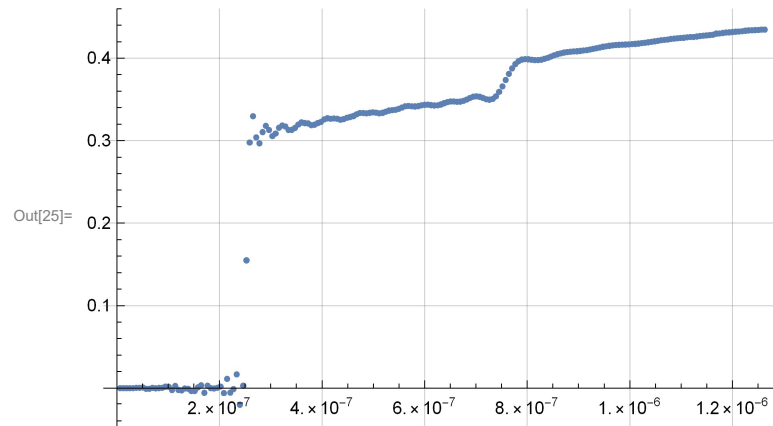
```

General:  $(3.72154 \times 10^{-11} + 1.07801 \times 10^{-10} i) (-4.28255794716605 \times 10^{-316} + 3.38860446812084 \times 10^{-315} i)$  is too small to represent as a normalized machine number; precision may be lost.

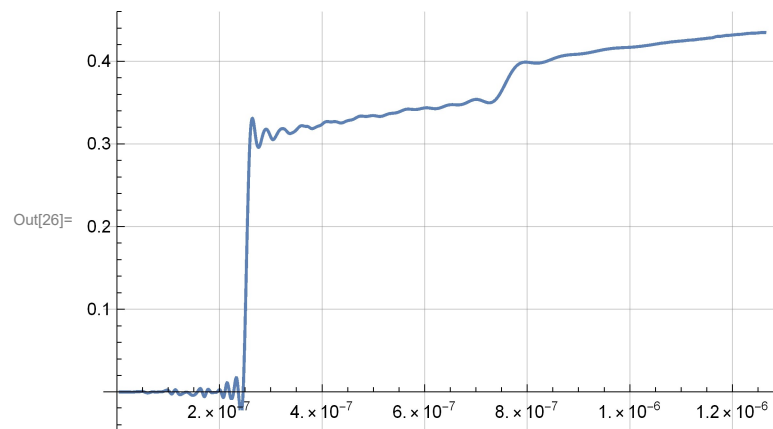
General:  $(3.72154 \times 10^{-11} - 1.07801 \times 10^{-10} i)(-4.28255794716605 \times 10^{-316} - 3.38860446812084 \times 10^{-315} i)$  is too small to represent as a normalized machine number; precision may be lost.

General:  $(-4.15427 \times 10^{-11} + 1.1239 \times 10^{-10} i)(8.7392971698209 \times 10^{-320} + 2.77618835699636 \times 10^{-318} i)$  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.



In[26]:= **ListLinePlot**[Liste, InterpolationOrder → 3, PlotRange → All, GridLines → Automatic]  
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In[27]:=

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In[28]:= lap[p_] := 1 / p * (1 - Exp[-tr * p]) *
      Exponentialfunktion
      (Z2 * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (1 - x)] + Z0 * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (1 - x)]) /
      Kos... Quadratwurzel Sinu... Quadratwurzel
      ((Z1 + Z2) * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * 1] + (Z0 + Z1 * Z2 / Z0) * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * 1]);
      Kos... Quadratwurzel Sinu... Quadratwurzel
```

```
M = 400; Talits = 220;
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Liste = Table[{5 * td / M * i, Talbot[lap, 5 * td / M * i, Talits]}], {i, 1, M}];
```

[Tabelle](#)

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ListPlot[Liste, PlotRange → All, GridLines → Automatic]
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```
ListLinePlot[Liste, InterpolationOrder → 3, PlotRange → All, GridLines → Automatic]
```

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General: Exp[-721.822 + 1447.21 *i*] is too small to represent as a normalized machine number; precision may be lost.

General: Exp[-755.808 + 1394.58 *i*] is too small to represent as a normalized machine number; precision may be lost.

General: Exp[-788.456 + 1341.96 *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.

