

a) Sprungantwort eines realen angepassten Energiekabels nach dem numerischen Talbot-Verfahren

b) Ausschnittsvergrößerung

c) Rechteckimpuls auf der realen angepassten Leitung nach dem numerischen Talbot-Verfahren

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

```
In[39]:= U = 380*^3;
P = 2929*^6;
Z0 = 0.01;
Z1 = 49.3;
l = 100*^3;
x = 100*^3;
Cs = 245.9*^-12;
Ls = 0.5981*^-6;
Rs = 10.8*^-6;
tr = 1*^-7;
Z2 = U^2 / P;
Gs = 17*^-12;
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);
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]

```

```

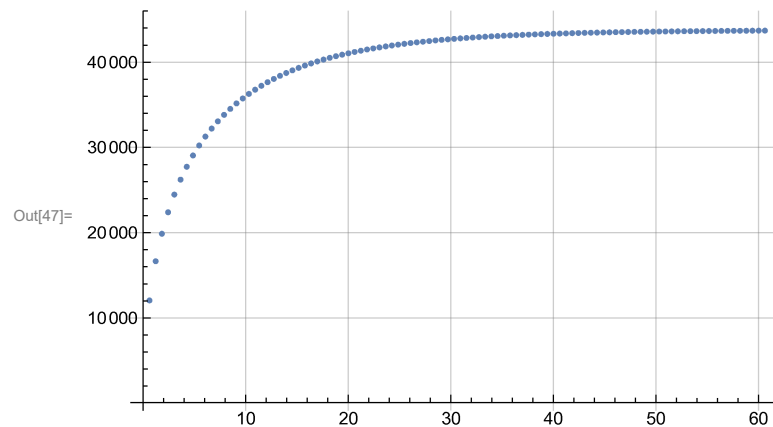
lap[p_] := U / p * (Z2 * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (1 - x)] + Z0 * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (1 - x)]) /
((Z1 + Z2) * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * 1] + (Z0 + Z1 * Z2 / Z0) * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * 1]);

```

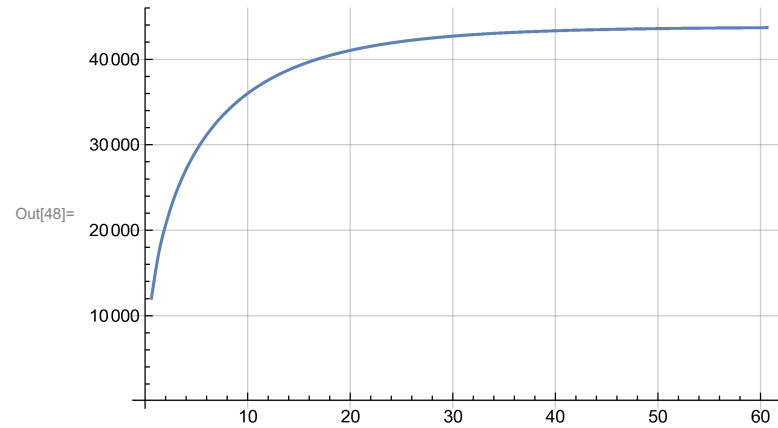
```
M = 100; Talits = 150;
```

```
Liste = Table[{50000 * td / M * i, Talbot[lap, 50000 * td / M * i, Talits]}, {i, 1, M}];
```

```
ListPlot[Liste, PlotRange -> All, GridLines -> Automatic]
```



```
In[48]:= ListLinePlot[Liste, InterpolationOrder → 3, PlotRange → All, GridLines → Automatic]  
|listenbezogene Liniengra... |Ordnung der Interpolation |Koordinatenb...|alle |Gitternetzlinien |automatisch
```



```
In[49]:= M = 800; Talits = 150;
Liste = Table[{20 * td / M * i, Talbot[lap, 20 * td / M * i, Talits]}, {i, 1, M}];
```

[Tabelle](#)

```
ListPlot[Liste, PlotRange -> All, GridLines -> Automatic]
```

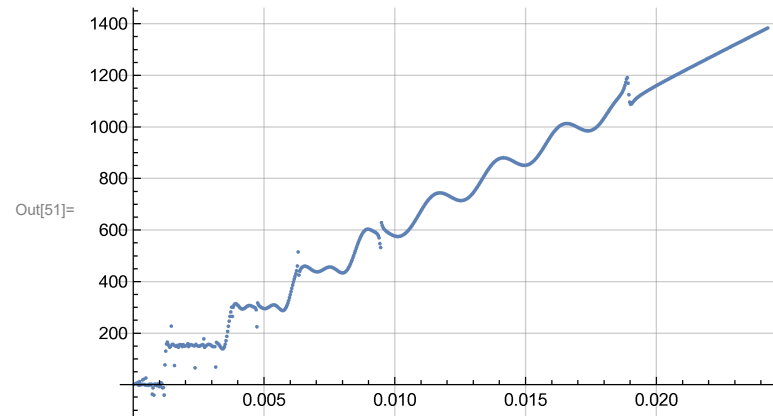
[listenbezogene Gr...](#) [Koordinatenb...](#) [alle](#) [Gitternetzlinien](#) [automatisch](#)

General: $\frac{1}{4.33552 \times 10^{292} - 1.95194 \times 10^{300} i}$ is too small to represent as a normalized machine number; precision may be lost.

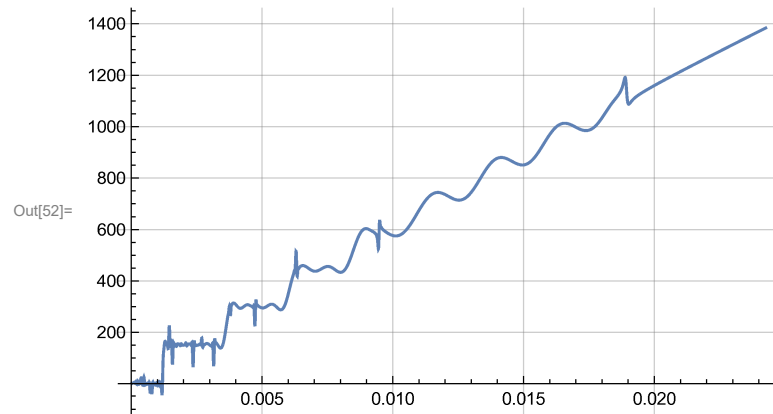
General: $(49.3001 + 0. i)(-6.59118885572871 \times 10^{-316} - 3.10157835291555 \times 10^{-316} i)$ is too small to represent as a normalized machine number; precision may be lost.

General: $(49.3001 + 0. i)(-6.59118885572871 \times 10^{-316} + 3.10157835291555 \times 10^{-316} i)$ 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[52]:= ListLinePlot[Liste, InterpolationOrder → 3, PlotRange → All, GridLines → Automatic]
|listenbezogene Liniengra... |Ordnung der Interpolation |Koordinatenb...|alle |Gitternetzlinien |automatisch
```



```
In[53]:= lap[p_] := U / 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 = 800; Talits = 150;
```

```
Liste = Table[{10 * td / M * i, Talbot[lap, 10 * 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]
```

```
|listenbezogene Liniengra... |Ordnung der Interpolation |Koordinatenb...|alle |Gitternetzlinien |automatisch
```

```
... General:  $\frac{1}{4.33552 \times 10^{292} - 1.95194 \times 10^{300} i}$  is too small to represent as a normalized machine number; precision may be lost.
```

```
... General:  $(49.3001 + 0. i)(-6.59118885572871 \times 10^{-316} - 3.10157835291555 \times 10^{-316} i)$  is too small to represent as a normalized machine number; precision may be lost.
```

```
... General:  $(49.3001 + 0. i)(-6.59118885572871 \times 10^{-316} + 3.10157835291555 \times 10^{-316} i)$  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.
```

