

a) Sprungantwort der realen angepassten 380 kV 4-Bündel-Freileitung 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[ ]:= U = 380*^3;
P = 604*^6;
Z0 = 0.01;
Z1 = 239;
l = 100*^3;
x = 100*^3;
Cs = 14.2*^-12;
Ls = 0.81*^-6;
Rs = 27.3*^-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]

```

```

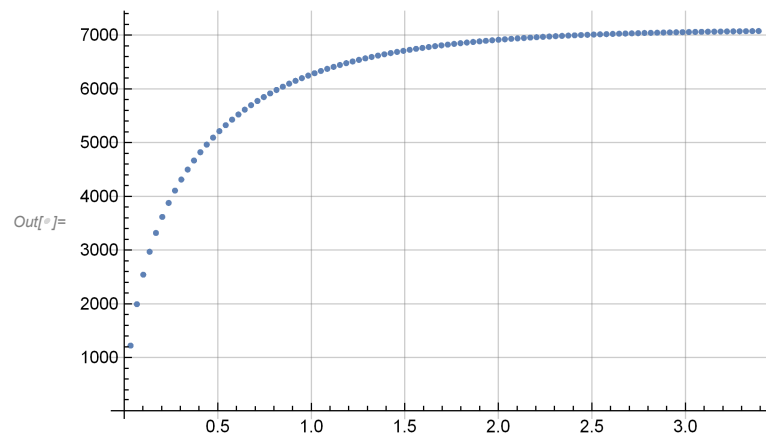
lap[p_] := U / p * (Z2 * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (1 - x)] + Z0 * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * (1 - x)]) /
((Z1 + Z2) * Cosh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * 1] + (Z0 + Z1 * Z2 / Z0) * Sinh[Sqrt[(Rs + p * Ls) * (Gs + p * Cs)] * 1]);

```

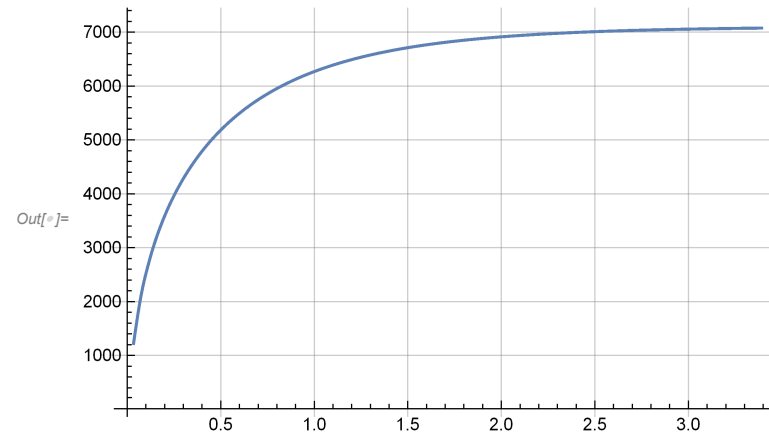
```
M = 100; Talits = 150;
```

```
Liste = Table[{10000 * td / M * i, Talbot[lap, 10000 * td / M * i, Talits]}, {i, 1, M}];
```

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



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



```
In[*]:= 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]
```

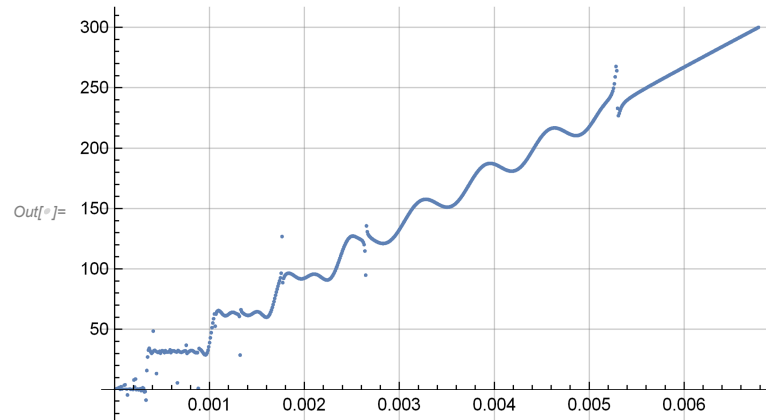
[listenbezogene Gr...](#) [Koordinatenb...](#) [alle](#) [Gitternetzlinien](#) [automatisch](#)

General: $\frac{1}{2.61547 \times 10^{293} - 4.61065 \times 10^{301} i}$ is too small to represent as a normalized machine number; precision may be lost.

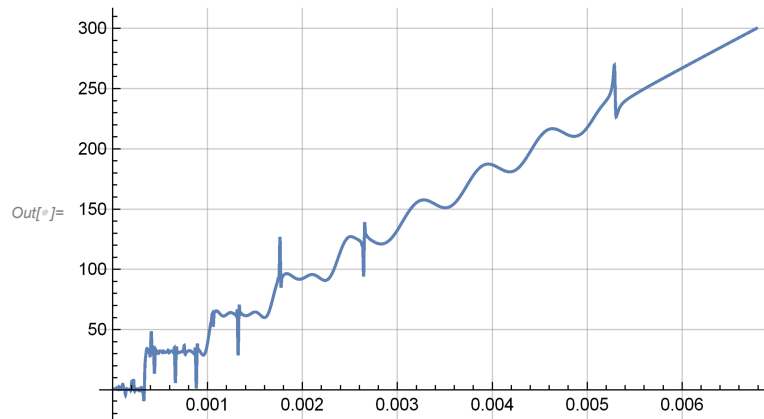
General: $(3.63499 \times 10^{-8} + 2.03569 \times 10^{-8} i)(-2.49513 \times 10^{-301} - 6.80369 \times 10^{-302} i)$ is too small to represent as a normalized machine number; precision may be lost.

General: $(239.073 + 0. i)(-2.818858851897207 \times 10^{-317} - 1.326454322979210 \times 10^{-317} i)$ 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.



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



```
In[ ]:= 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:  $\frac{1}{2.61547 \times 10^{293} - 4.61065 \times 10^{301} i}$  is too small to represent as a normalized machine number; precision may be lost.
```

```
... General:  $(3.63499 \times 10^{-8} + 2.03569 \times 10^{-8} i)(-7.9099 \times 10^{-302} + 1.98096 \times 10^{-301} i)$  is too small to represent as a normalized machine number; precision may be lost.
```

```
... General:  $(239.073 + 0. i)(-2.818858851897207 \times 10^{-317} - 1.326454322979210 \times 10^{-317} i)$  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.
```

