Auswertung

November 9, 2023

0.0.1 Vorbereitungen

```python
[1]: import pandas as pd
     import seaborn as sns
     from matplotlib import pyplot as plt
```

```python
[2]: sns.set_theme(context='paper', style="whitegrid", color_codes=True)
```

```python
[3]: def read_csv(filename):
         """
         Hilfsfunktion: Lese Datei mit Tabulator als Trennzeichen
         """
         return pd.read_csv(filename, sep='\t')
```

```python
[70]: def plot(data):
          sns.relplot(
              data=data,
              x="H",
              y="M",
              hue='Stromstärke',
              height=5,
              legend='full'
          )
```

```python
[23]: def subplot(data, axis=None):
          sns.scatterplot(
              data=data,
              x="H",
              y="M",
              hue='Stromstärke',
              marker='x',
              ax=axis
          )
```
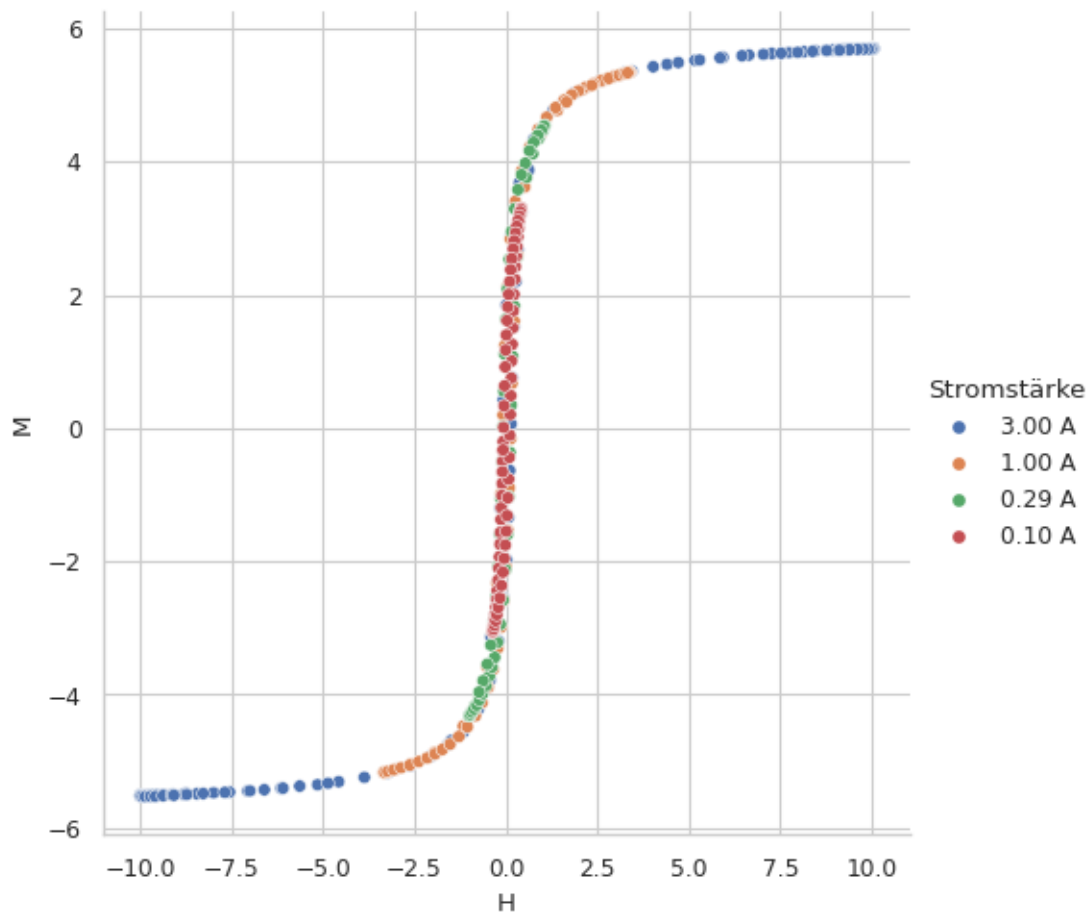
0.1 3.3.1

```
[24]: a = pd.read_csv("3.3.1.a.csv", sep='\t')
      b = pd.read_csv("3.3.1.b.csv", sep='\t')
      c = pd.read_csv("3.3.1.c.csv", sep='\t')
      d = pd.read_csv("3.3.1.d.csv", sep='\t')
```
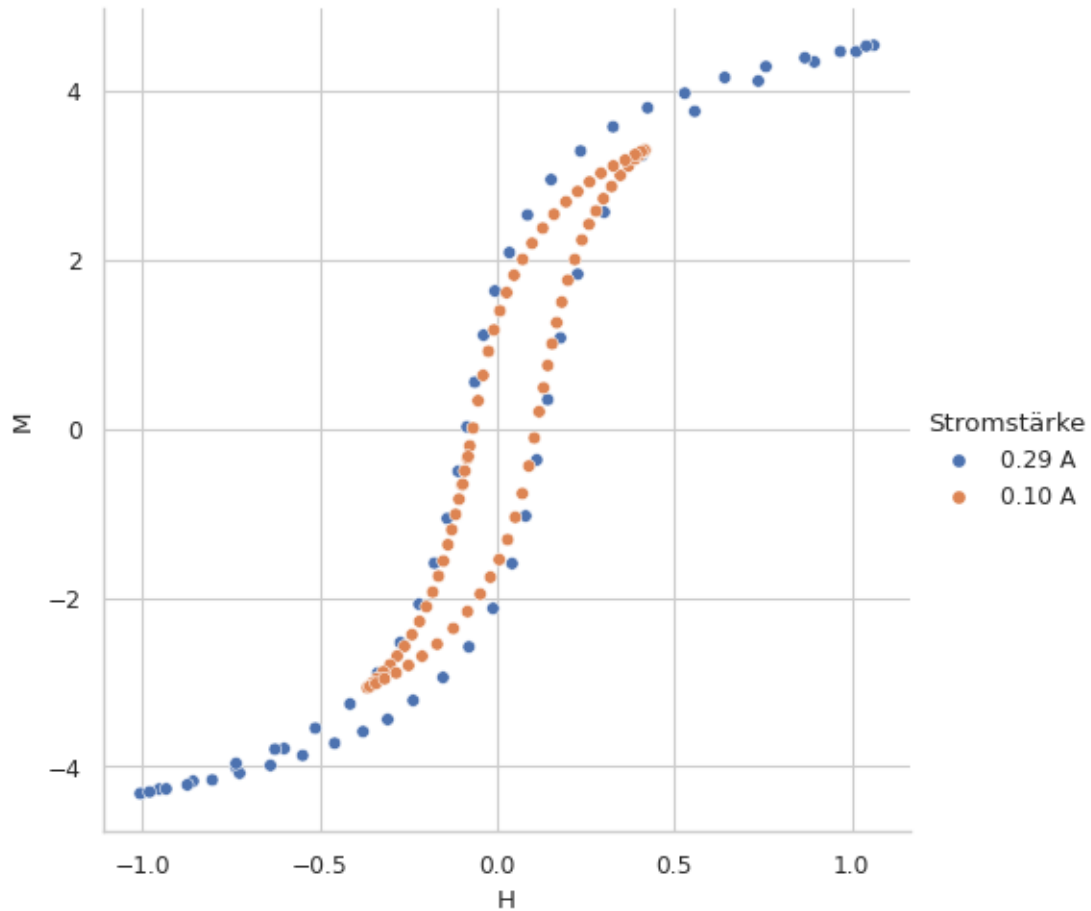
```
[25]: a['Stromstärke'] = '3.00 A'
      b['Stromstärke'] = '1.00 A'
      c['Stromstärke'] = '0.29 A'
      d['Stromstärke'] = '0.10 A'
```

Alle Messungen in einem Plot

```
[49]: all = pd.concat([a,b,c,d])
      plot(all)
```



```
[53]: plot(pd.concat([c,d]))
```

Alle Messungen in verschiedenen Plots

```
[50]: def subplot(data, axis=None):
          sns.scatterplot(
              data=data,
              x="H",
              y="M",
              hue='Stromstärke',
              marker='x',
              ax=axis
          )
```

```
[52]: fig = plt.figure(figsize=(12,12))
      fig.subplots_adjust(hspace=0.3, wspace=0.3)

      # 4 subplots jeweils 1/2 Breite
      # https://matplotlib.org/stable/api/figure_api.html#matplotlib.figure.Figure.
       ↪add_subplot
```
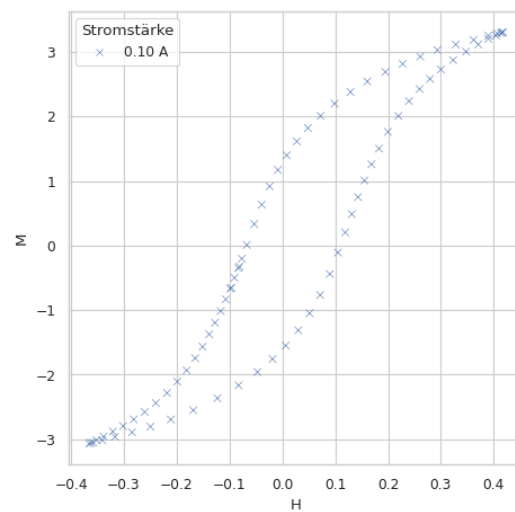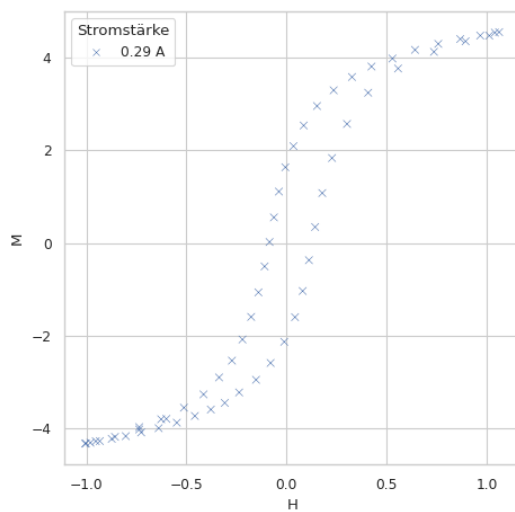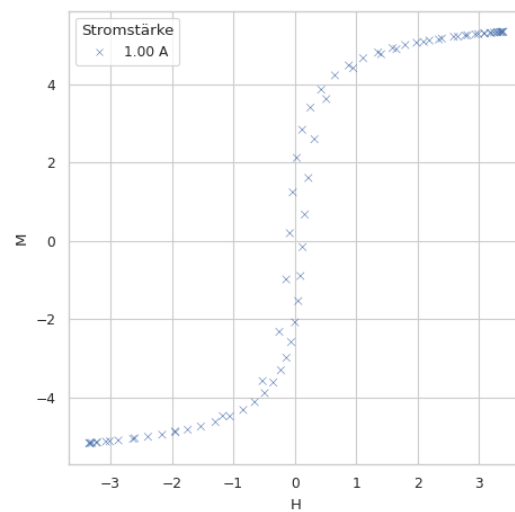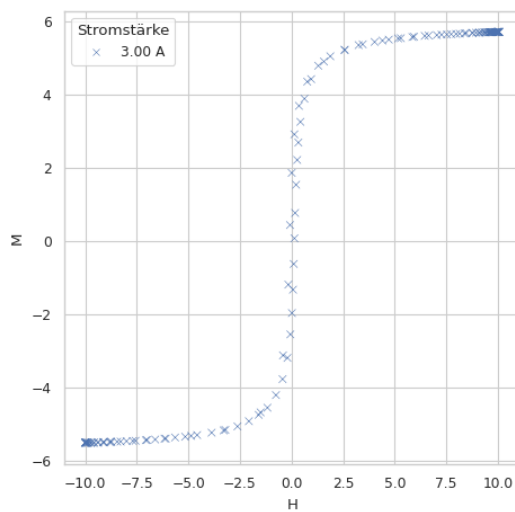
```
ax = fig.add_subplot(2, 2, 1)
subplot(a, axis=ax)

ax = fig.add_subplot(2, 2, 2)
subplot(b, axis=ax)

ax = fig.add_subplot(2, 2, 3)
subplot(c, axis=ax)

ax = fig.add_subplot(2, 2, 4)
subplot(d, axis=ax)

plt.show()
```
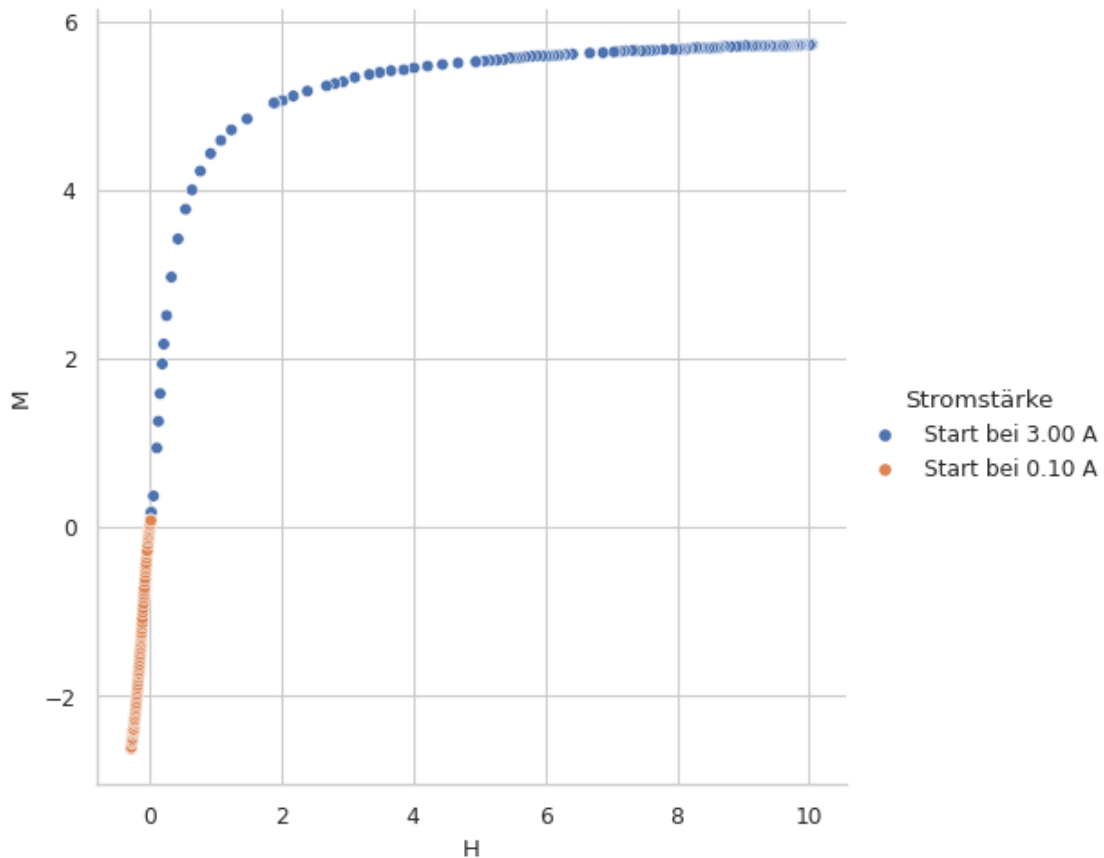
0.2 3.3.2

```
[66]: a = pd.read_csv('3.3.2.a.csv', sep='\t')
      b = pd.read_csv('3.3.2.b.csv', sep='\t')
```

```
[67]: a['Stromstärke'] = 'Start bei 3.00 A'
      b['Stromstärke'] = 'Start bei 0.10 A'
```

```
[68]: plot(pd.concat([a, b]))
```


0.3 3.3.3
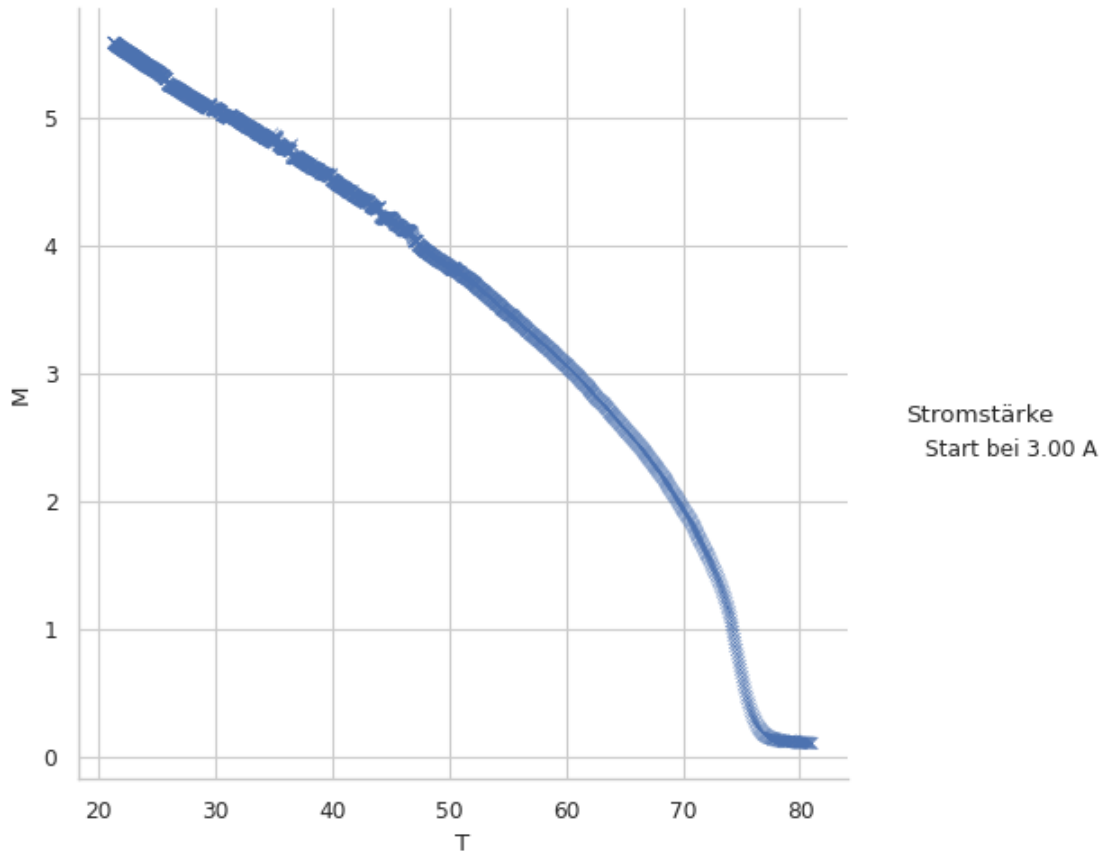
```
[87]: data = pd.read_csv('3.3.3.csv', sep='\t')
      data['Stromstärke'] = 'Start bei 3.00 A'

      sns.relplot(
          data=data,
          x="T",
          y="M",
          height=5,
```

```
    hue='Stromstärke',
    marker='x',
    legend='full'
)
```

[87]: `<seaborn.axisgrid.FacetGrid at 0x7f7c43dc8fd0>`

0.4 3.3.3

Messungsdetails: * 3.4.1: 0.94A * 3.4.2: 3.0A, 1mm * 3.4.3: 2.12A, 0.5mm * 3.4.4: 1.27A, 0.2mm * 3.4.5: 1.0A, 0.125mm * 3.4.6: 0.79A, 0.075mm * 3.4.7: 0.50A, 0.0mm

```
[95]: a = pd.read_csv('3.4.1.csv', sep='\t')
      b = pd.read_csv('3.4.2.csv', sep='\t')
      c = pd.read_csv('3.4.3.csv', sep='\t')
      d = pd.read_csv('3.4.4.csv', sep='\t')
      e = pd.read_csv('3.4.5.csv', sep='\t')
      f = pd.read_csv('3.4.6.csv', sep='\t')
      g = pd.read_csv('3.4.7.csv', sep='\t')
```

```
[96]: a['Stromstärke'] = '0.94 A'
      b['Stromstärke'] = '3.00 A'
      c['Stromstärke'] = '2.12 A'
      d['Stromstärke'] = '1.27 A'
      e['Stromstärke'] = '1.00 A'
      f['Stromstärke'] = '0.79 A'
      g['Stromstärke'] = '0.50 A'
```

```
[98]: plot(pd.concat([b,c,d,e,f,g]))
```