


```
j = 1
while j <= len(df):
    data.append(float(df.iloc[j, idx]))

j = j + 26
return data

def getActualDates(self, day_diff, room_temp, device_temp):
    # Accelerated Aging Test Formula
    exp = (room_temp - device_temp)/10.0
    factor = 2**exp
    day_real = day_diff * factor
    return int(day_real)

def getDatetime(self, m_d_y):
    """
    m_d_y is a string in month, day, year format
    """
    time_list = m_d_y.split("/")
    date = datetime.date(2022, int(time_list[0]), int(time_list[1]))
    return date

def addNewIDE(start, end):
    """
    Create a list of new IDE with names.
    start: the start number of IDE
    end: the end number of IDE
    """
    L = []
    for i in range(start, end):
        L.append(str(i) + "-2-m")
        L.append(str(i) + "-2-s")
        L.append(str(i) + "-4-m")
        L.append(str(i) + "-4-s")
        L.append(str(i) + "-8-m")
        L.append(str(i) + "-8-s")
        L.append(str(i) + "-16-m")
        L.append(str(i) + "-16-s")

    df_new_IDE = pd.DataFrame(L, columns=['new IDE name'])

#Export a csv file with new IDEs
df_new_IDE.to_csv("new_IDE.csv", index=False)
return df_new_IDE
```

```
def graphIESpan(df):
    # file =
    # # creating the dataset
    # data = {'C':20, 'C++':15, 'Java':30,
    #         'Python':35}
    # courses = list(data.keys())
    # values = list(data.values())
    #
    # fig = plt.figure(figsize = (10, 5))
    #
    # # creating the bar plot
    # plt.bar(courses, values, color = 'maroon', width = 0.4)
    #
    # plt.xlabel("IDEs")
```

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```
# plt.ylabel("Days to fail")
# plt.title("life Span of IDEs")
# plt.show()
return None
```

Matplotlib Version 3.5.1
Seaborn Version 0.11.2

In [10]: # Step 2: Initialize tested IDEs

```
# Read experiment date file.
date = "date.csv"
df_date = pd.read_csv(date)

# Initialize IDEs
#Old Devices
IDE_12 = IDE([12, [8], ["m","s"], "csv")
#IDE_14 = IDE([14, [16], ["m","s"], "csv")
IDE_16 = IDE([16, [2,4,8,16], ["m","s"], "csv")
IDE_20 = IDE([20, [2,16], ["m","s"], "csv")]

#New Devices
IDE_22 = IDE([22, [2,4,8,16], ["m","s"], "csv")
IDE_26 = IDE([26, [2,4,8,16], ["m","s"], "csv")
IDE_27 = IDE([27, [2,4,8,16], ["m","s"], "csv")
IDE_28 = IDE([28, [2,4,8,16], ["m","s"], "csv")
IDE_31 = IDE([31, [2,4,8,16], ["m","s"], "csv")]

# Track device results
total_channels = 0
num_failed = 0
num_good_2 = 0
num_good_4 = 0
num_good_8 = 0
num_good_16 = 0

# List of all IDEs
IDE_list = [IDE_12, IDE_16, IDE_20, IDE_22, IDE_26, IDE_27, IDE_28, IDE_31]

# IDE_12 as an example

# Iterate through one IDE
date_idx = 0

for ide in IDE_list:
    ide.setData()
    for file in ide.getDataFile():
        df = pd.read_csv(file)

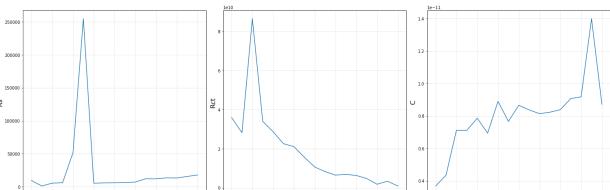
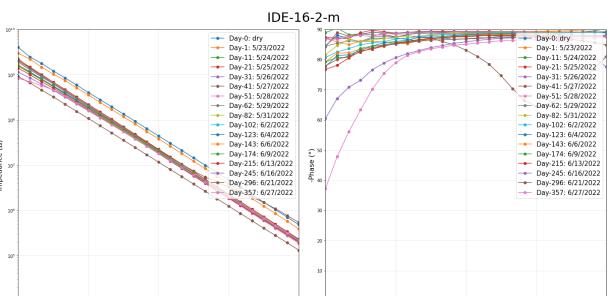
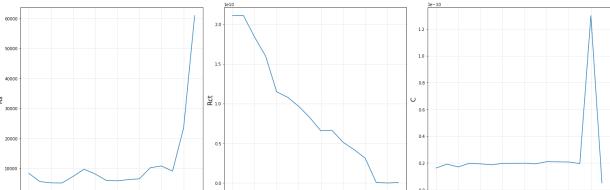
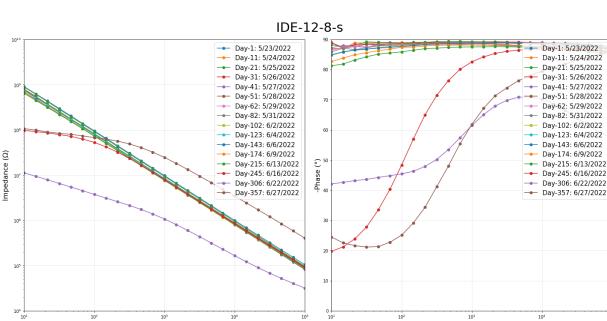
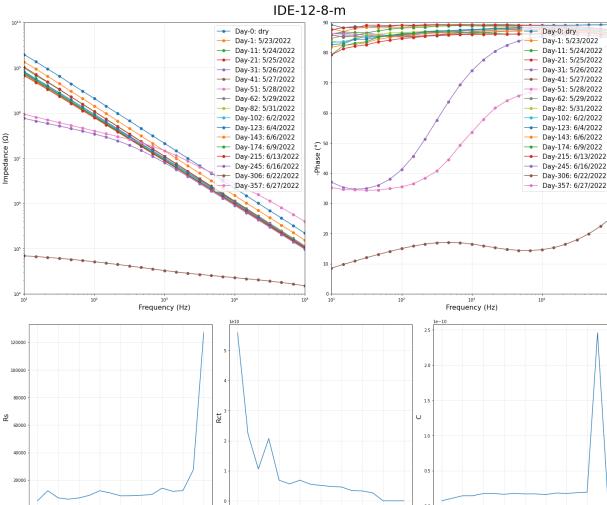
        #First clean the data to only include the 25 items
        ide.cleanData(df)

        #Read the data again
        df = pd.read_csv(file)

        #Then
        Rs = ide.getRC(df, "Rs")
        Rct = ide.getRC(df, "Rct")
```

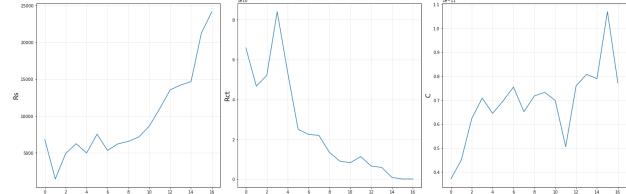
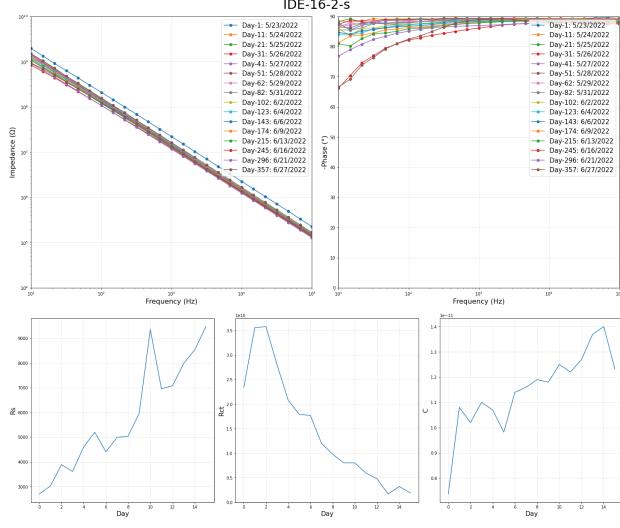
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```
C = ide.getRC(df, "C")
ide.getGraph(file, df, df_date, date_idx, Rs, Rct, C)
date_idx += 1
```



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**IDE-16-4-s**

Legend for IDE-16-4-s:

- Day-1: 5/3/2022
- Day-11: 5/4/2022
- Day-21: 5/5/2022
- Day-31: 5/6/2022
- Day-41: 5/7/2022
- Day-51: 5/8/2022
- Day-61: 5/9/2022
- Day-71: 5/10/2022
- Day-81: 5/11/2022
- Day-102: 6/2/2022
- Day-123: 6/4/2022
- Day-143: 6/6/2022
- Day-174: 6/9/2022
- Day-215: 6/13/2022
- Day-296: 6/21/2022
- Day-357: 6/27/2022

IDE-16-4-m

Legend for IDE-16-4-m:

- Day-9: 5/5/2022
- Day-11: 5/6/2022
- Day-21: 5/7/2022
- Day-31: 5/8/2022
- Day-41: 5/9/2022
- Day-51: 5/10/2022
- Day-61: 5/11/2022
- Day-71: 5/12/2022
- Day-81: 5/13/2022
- Day-102: 6/2/2022
- Day-123: 6/4/2022
- Day-143: 6/6/2022
- Day-174: 6/9/2022
- Day-215: 6/13/2022
- Day-296: 6/21/2022
- Day-357: 6/27/2022

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6/27/22, 6:33 PM

[20220609]TBBL-Impedance Data Analysis

IDE-16-8-m

Legend for IDE-16-8-m:

- Day-0: dry
- Day-1: 5/3/2022
- Day-11: 5/4/2022
- Day-21: 5/5/2022
- Day-31: 5/6/2022
- Day-41: 5/7/2022
- Day-51: 5/8/2022
- Day-61: 5/9/2022
- Day-71: 5/10/2022
- Day-81: 5/11/2022
- Day-102: 6/2/2022
- Day-123: 6/4/2022
- Day-143: 6/6/2022
- Day-174: 6/9/2022
- Day-215: 6/13/2022
- Day-296: 6/21/2022
- Day-357: 6/27/2022

6/27/22, 6:33 PM

[20220609]TBBL-Impedance Data Analysis

IDE-16-16-m

Legend for IDE-16-16-m:

- Day-0: dry
- Day-1: 5/3/2022
- Day-11: 5/4/2022
- Day-21: 5/5/2022
- Day-31: 5/6/2022
- Day-41: 5/7/2022
- Day-51: 5/8/2022
- Day-61: 5/9/2022
- Day-71: 5/10/2022
- Day-81: 5/11/2022
- Day-102: 6/2/2022
- Day-123: 6/4/2022
- Day-143: 6/6/2022
- Day-174: 6/9/2022
- Day-215: 6/13/2022
- Day-296: 6/21/2022
- Day-357: 6/27/2022

IDE-16-8-s

Legend for IDE-16-8-s:

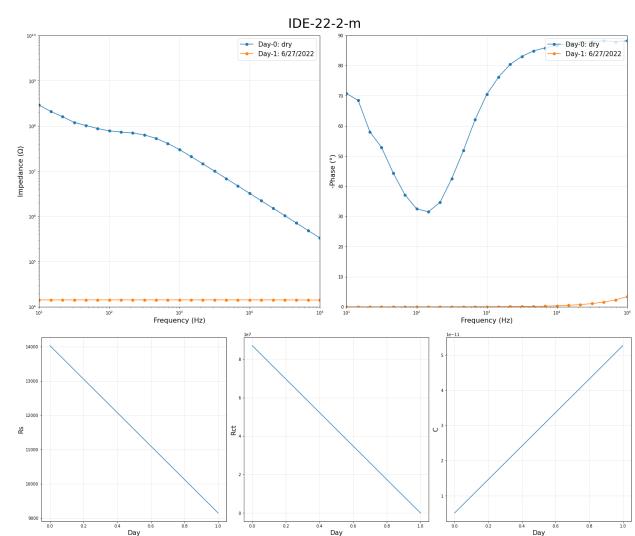
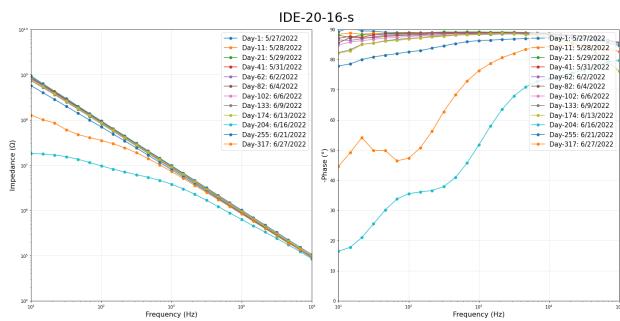
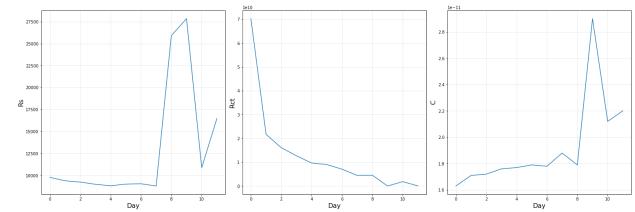
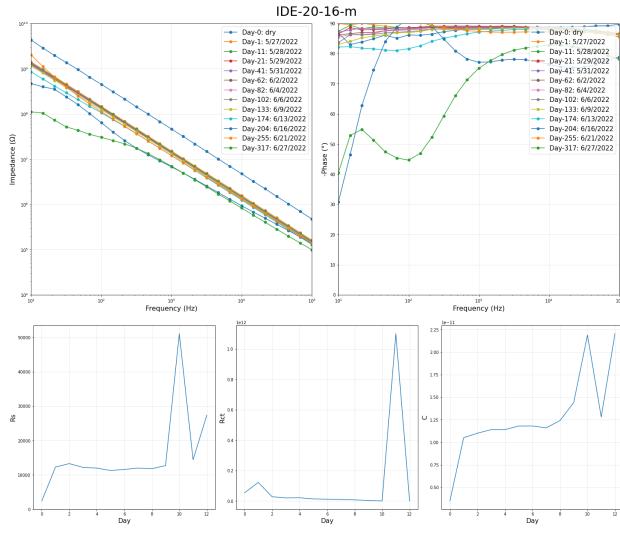
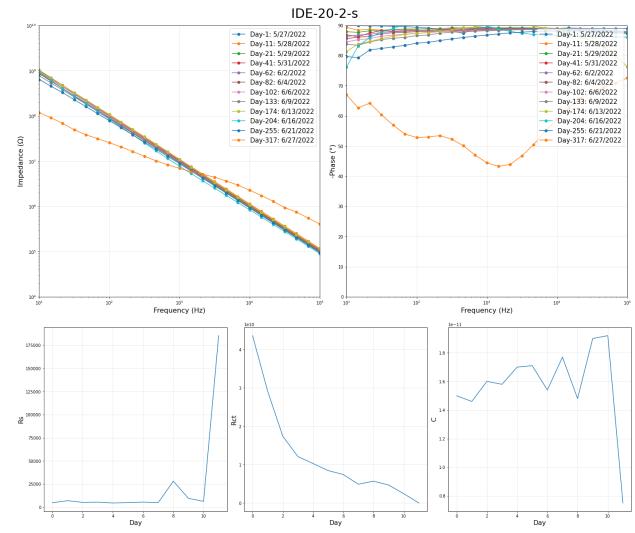
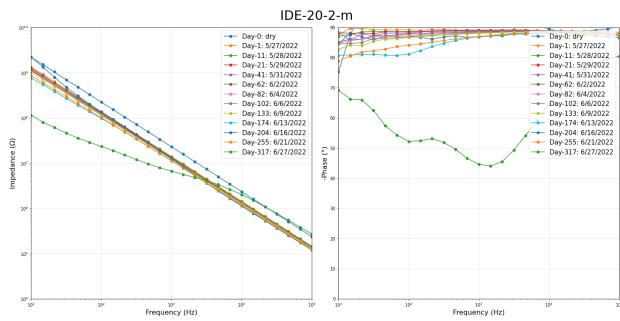
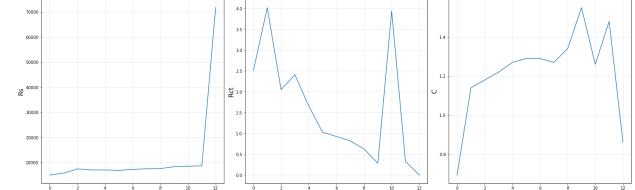
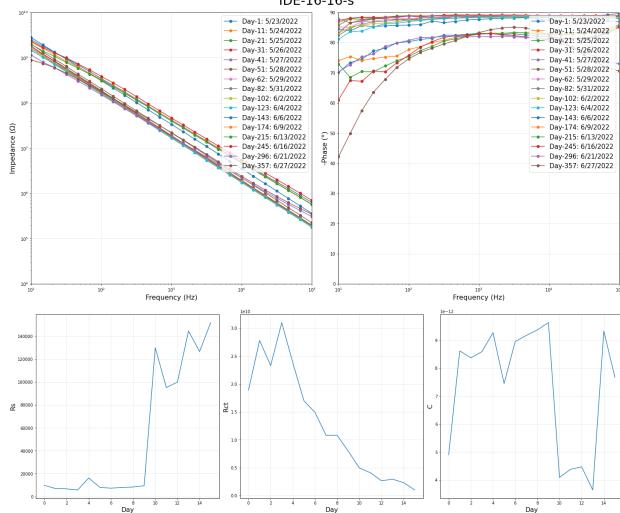
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- Day-21: 5/25/2022
- Day-31: 5/26/2022
- Day-41: 5/27/2022
- Day-51: 5/28/2022
- Day-61: 5/29/2022
- Day-71: 5/30/2022
- Day-81: 5/31/2022
- Day-102: 6/1/2022
- Day-123: 6/4/2022
- Day-143: 6/6/2022
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- Day-357: 6/27/2022

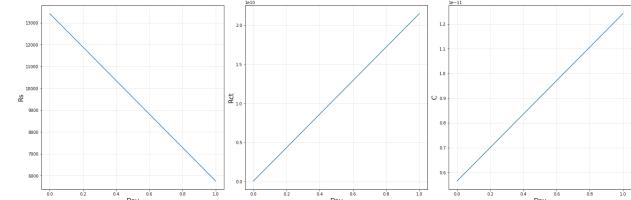
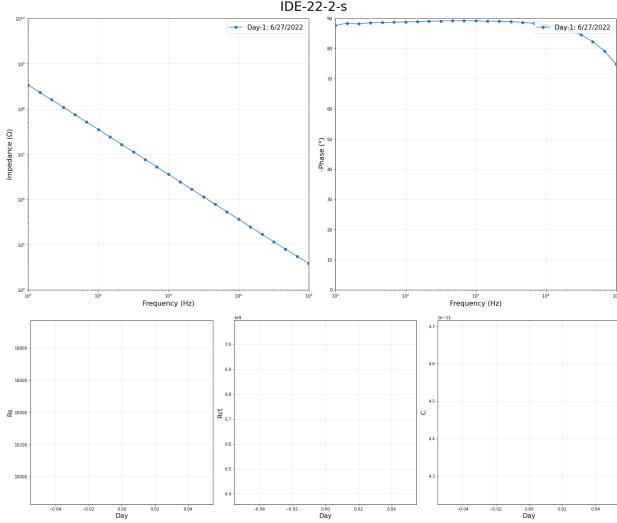
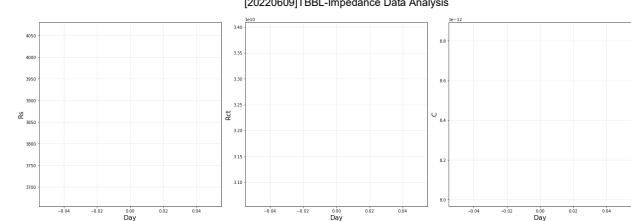
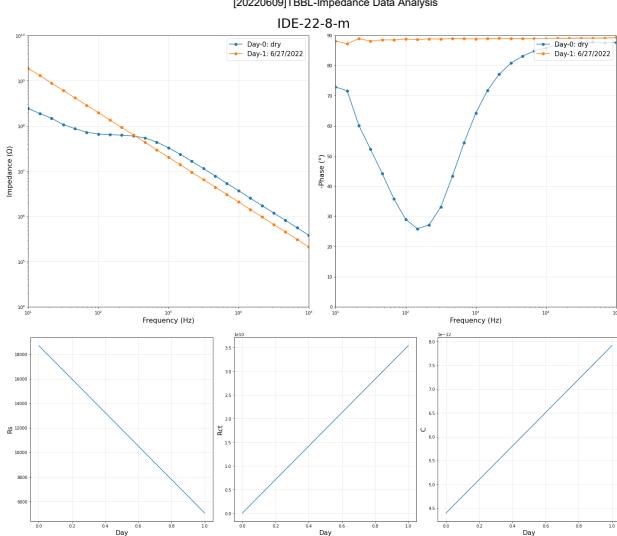
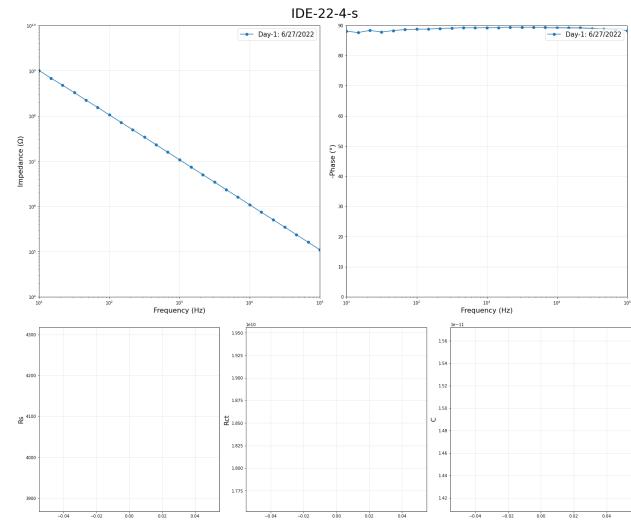
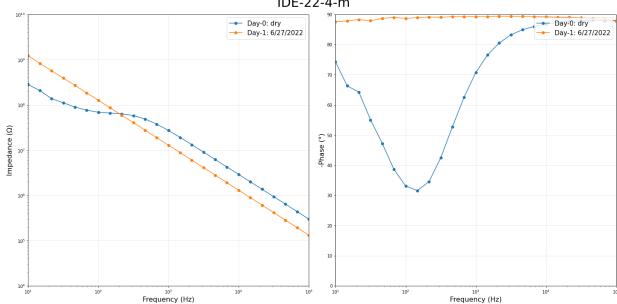
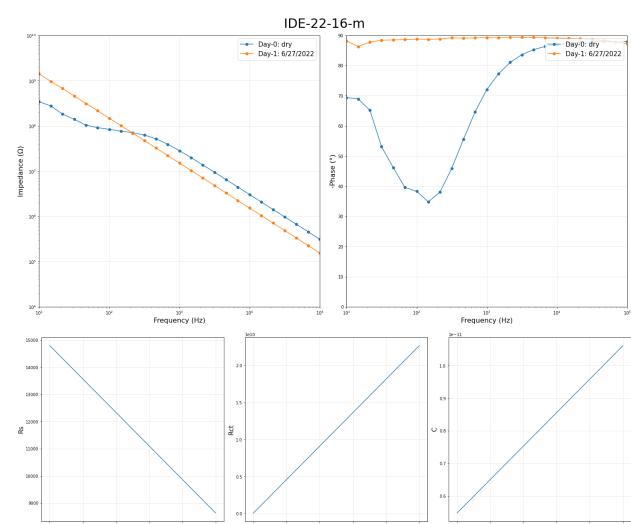
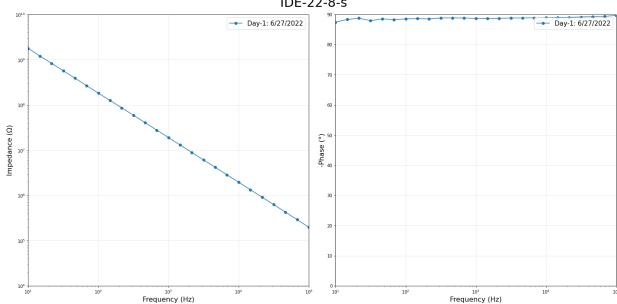
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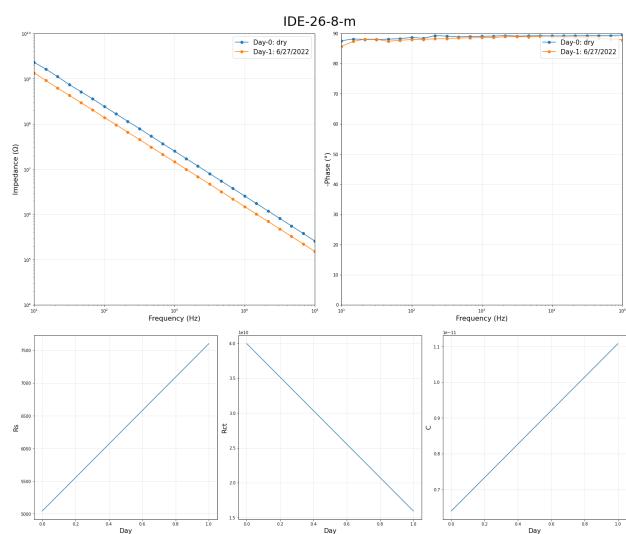
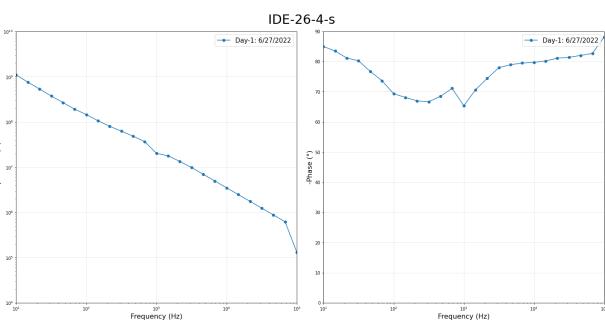
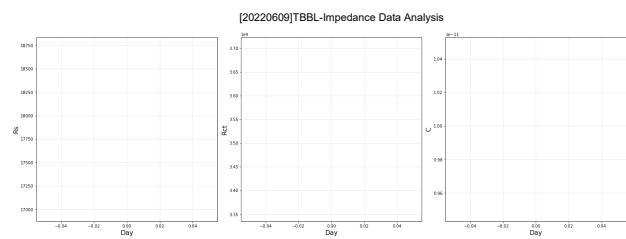
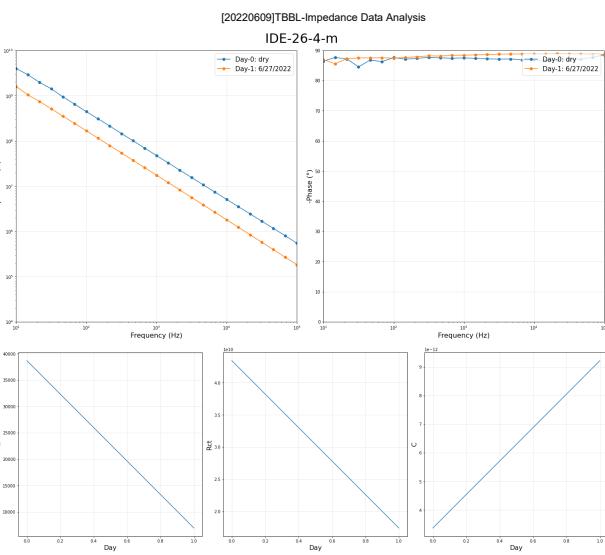
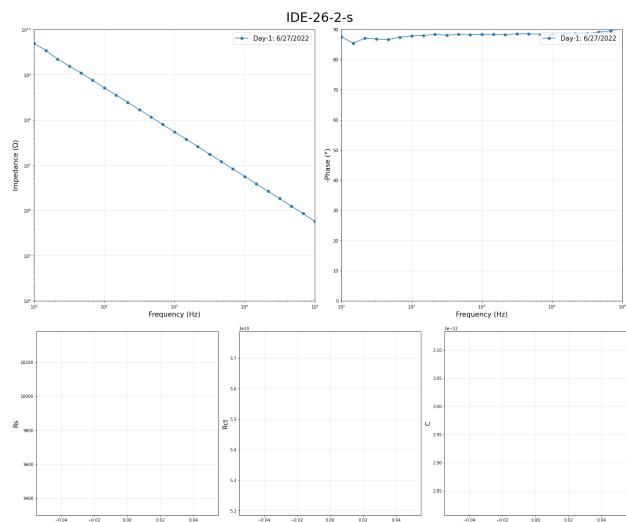
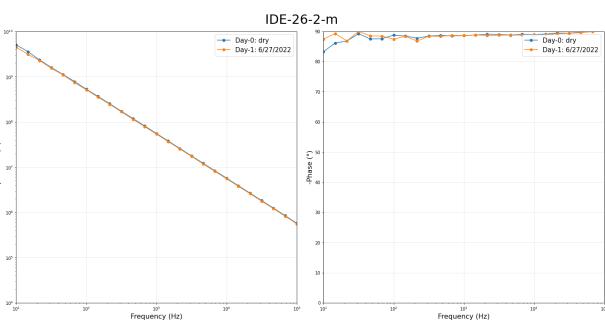
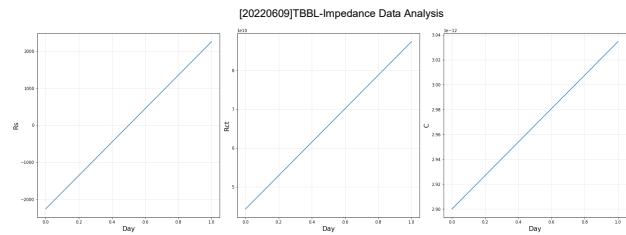
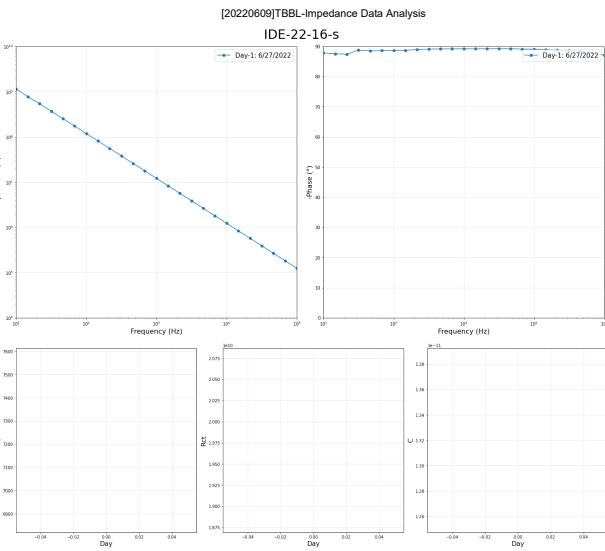
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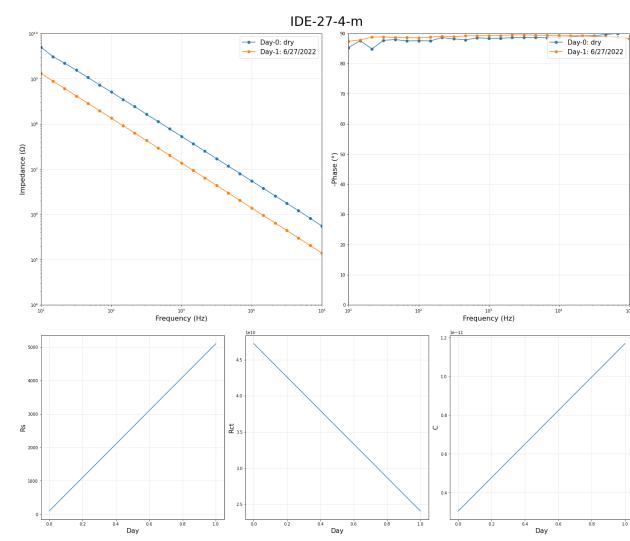
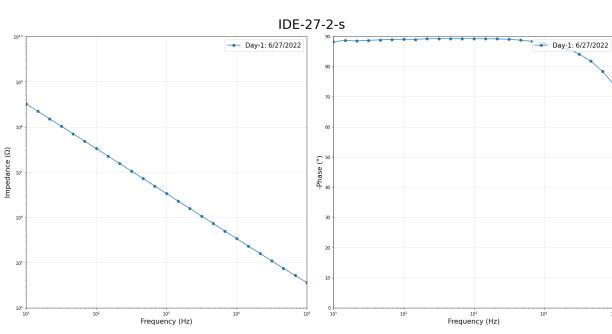
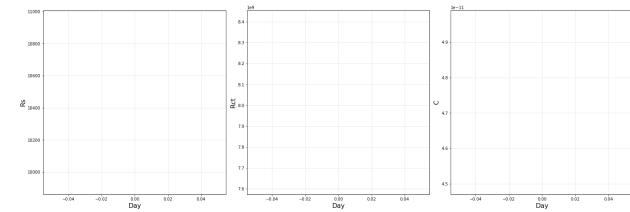
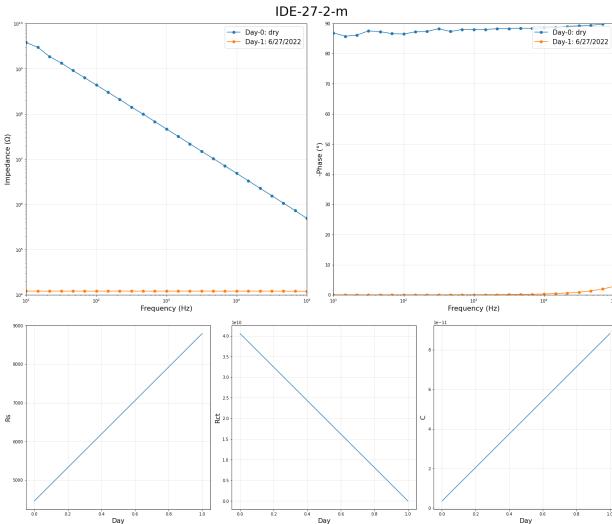
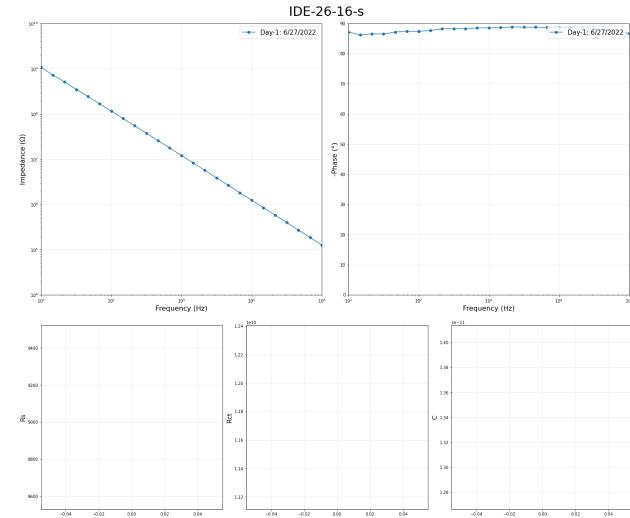
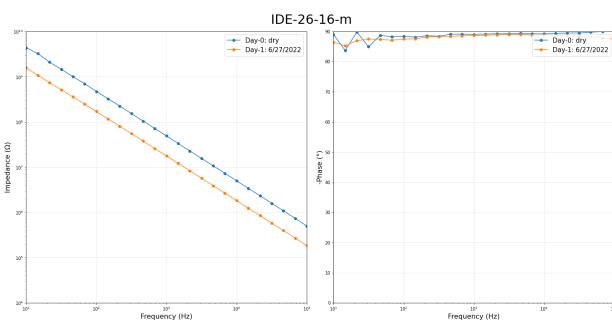
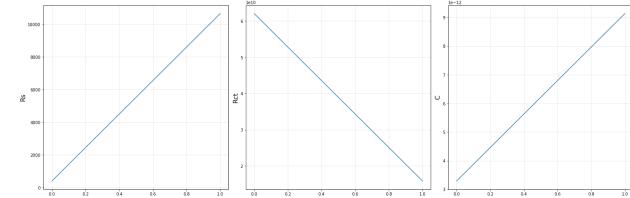
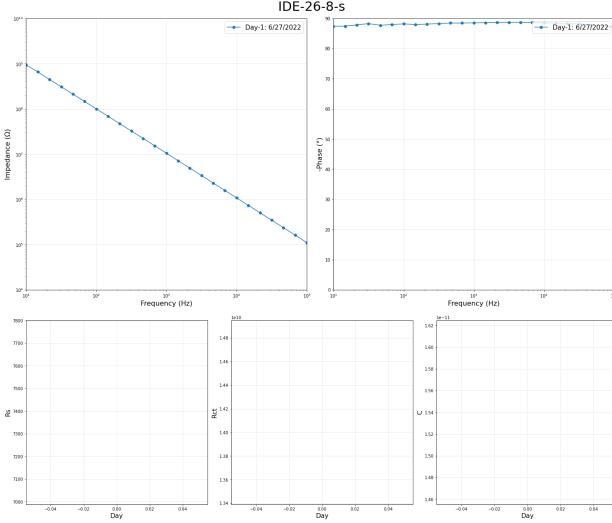
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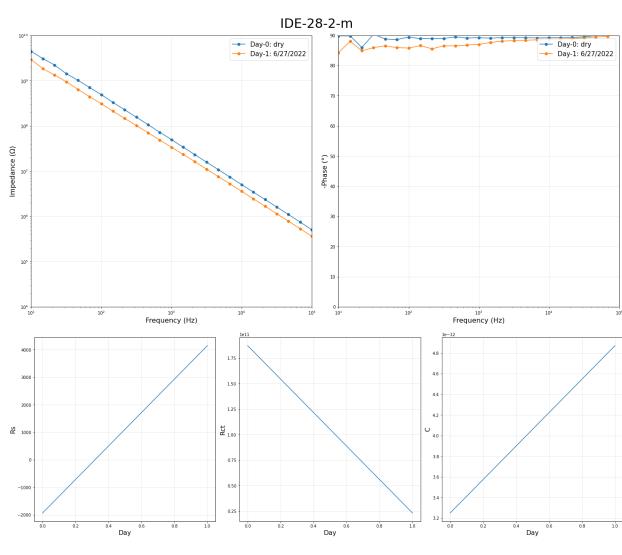
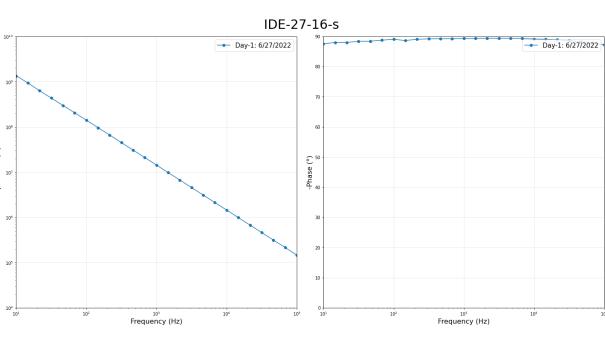
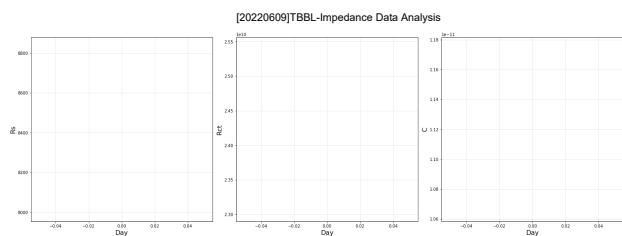
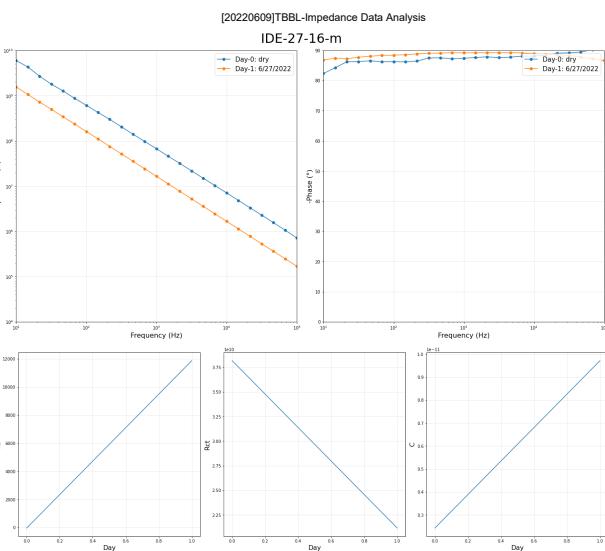
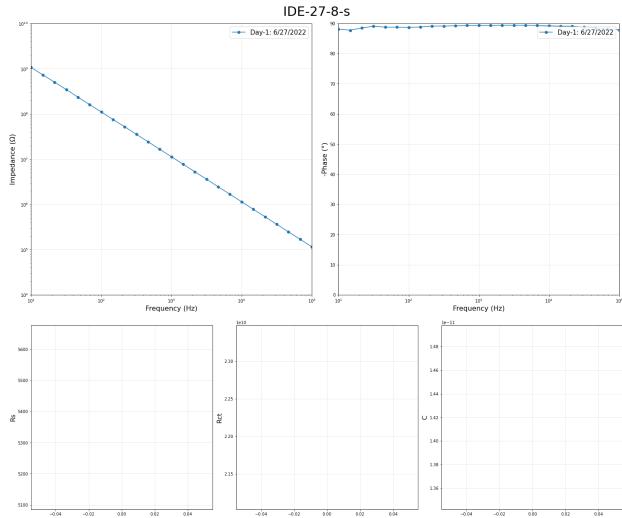
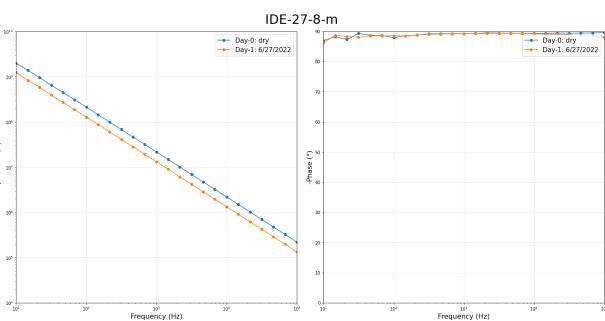
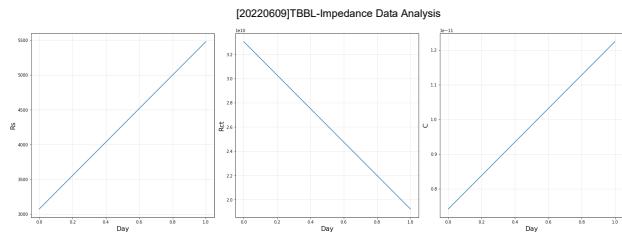
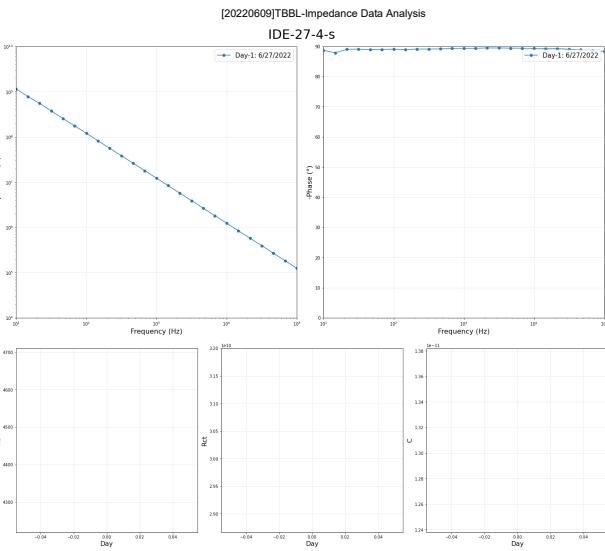
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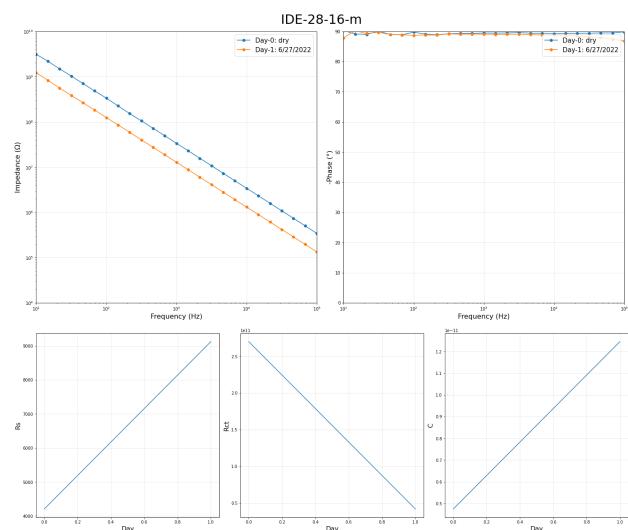
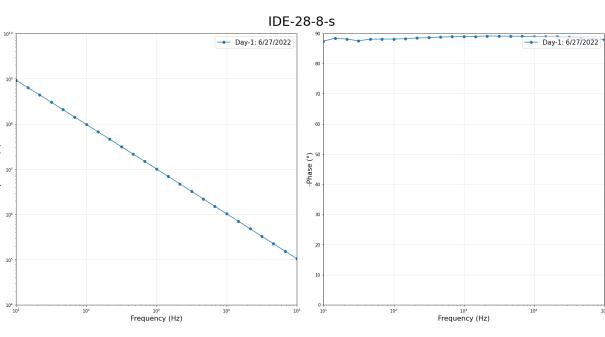
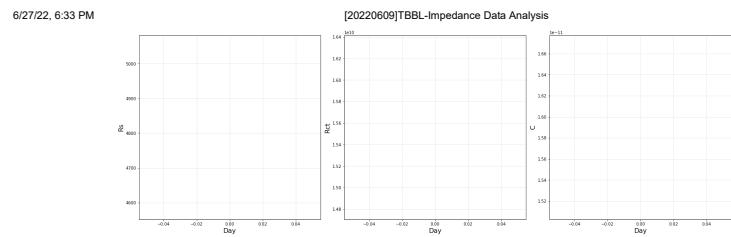
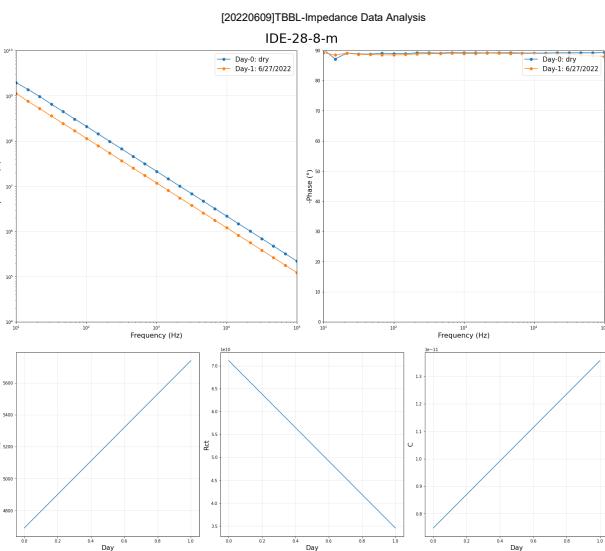
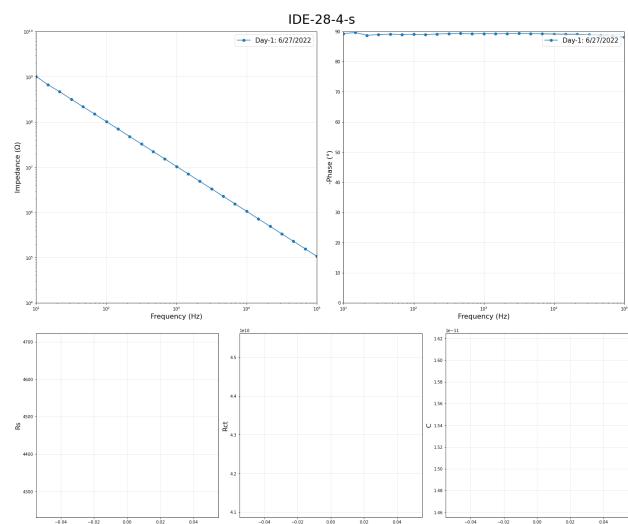
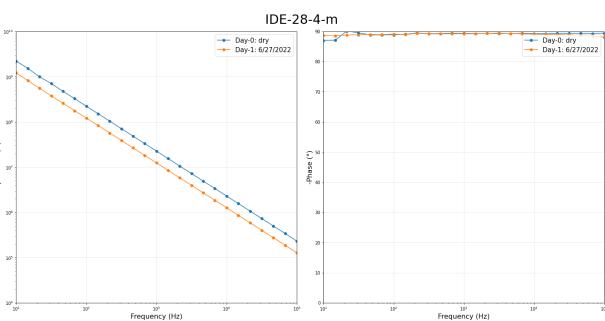
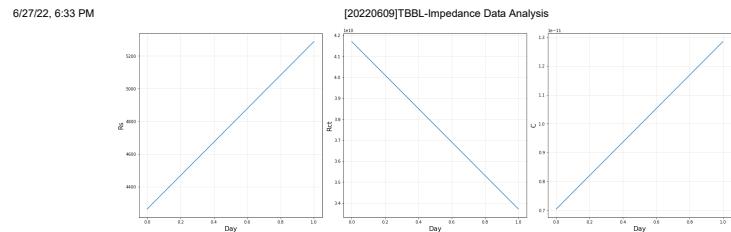
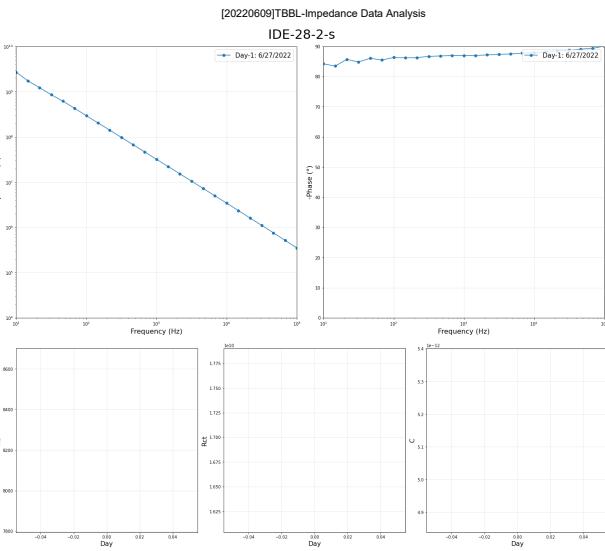


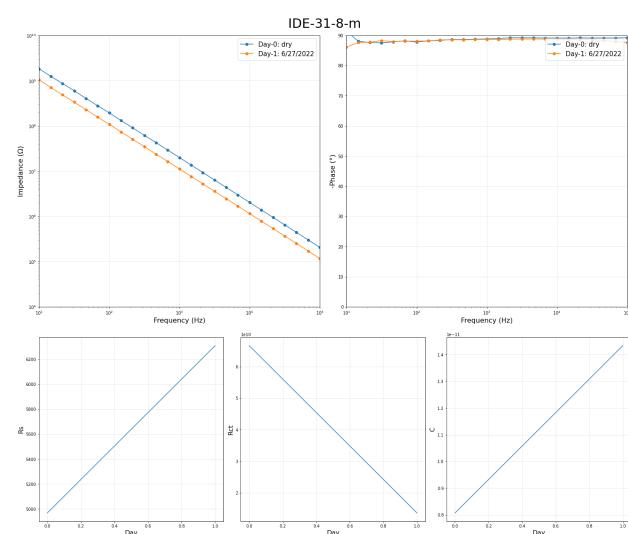
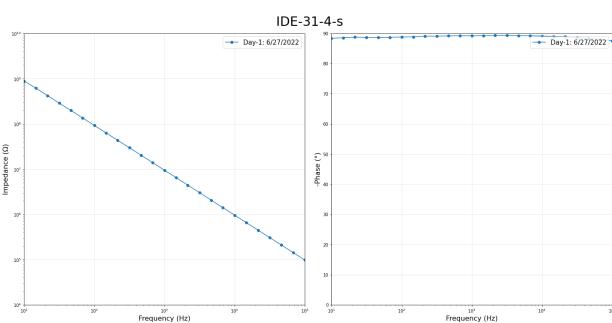
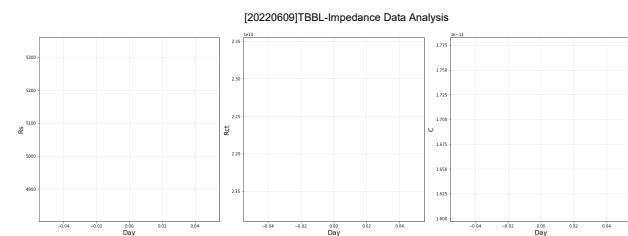
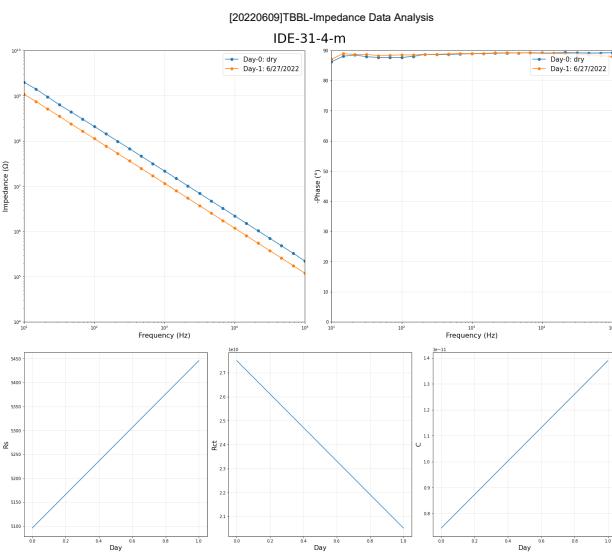
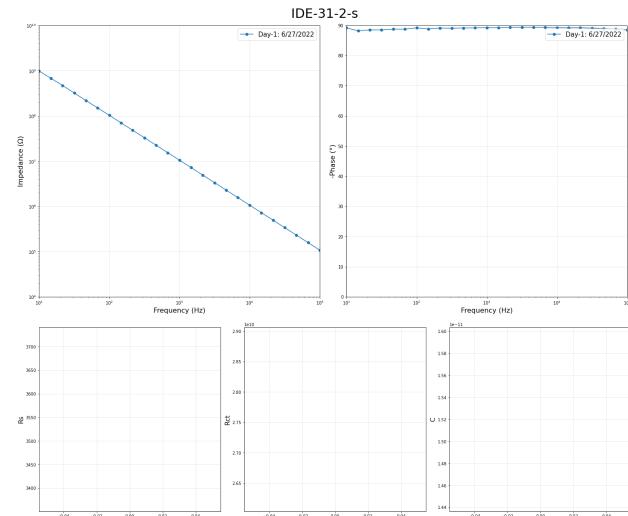
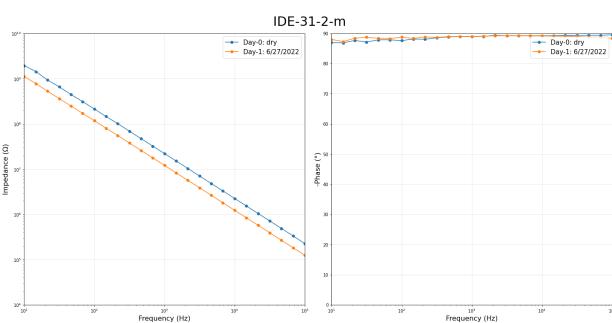
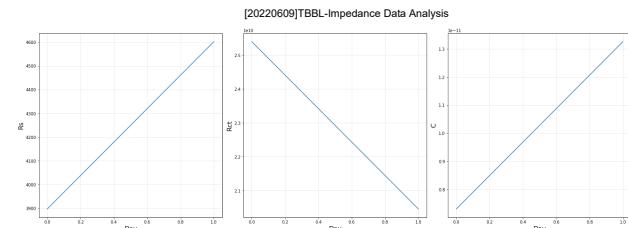
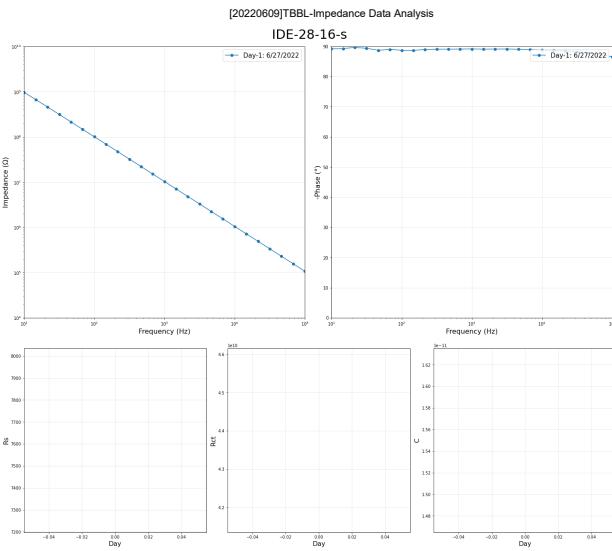
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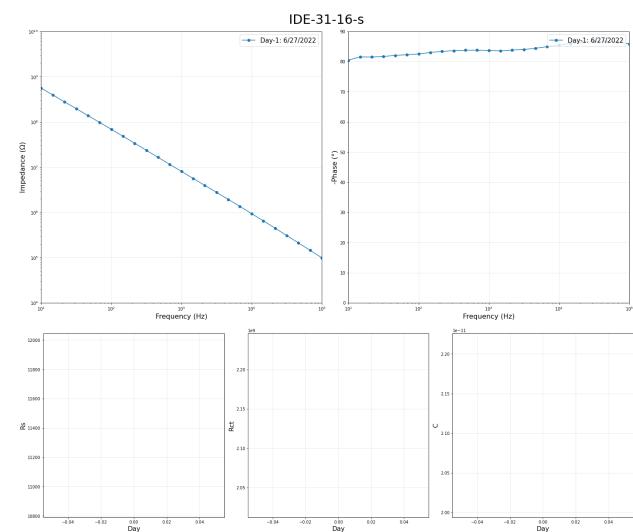
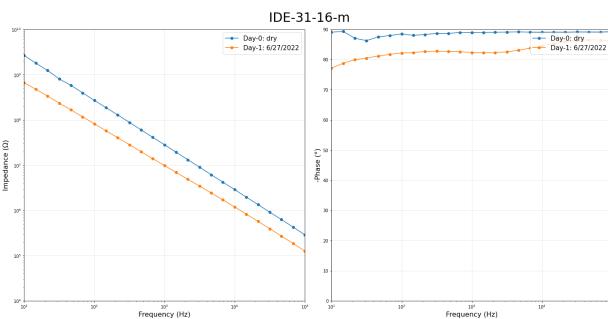
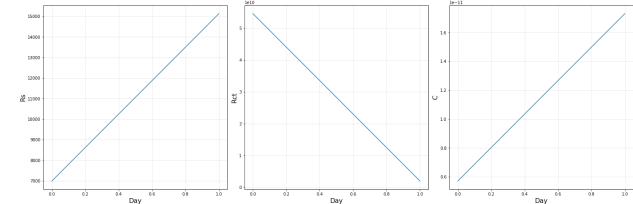
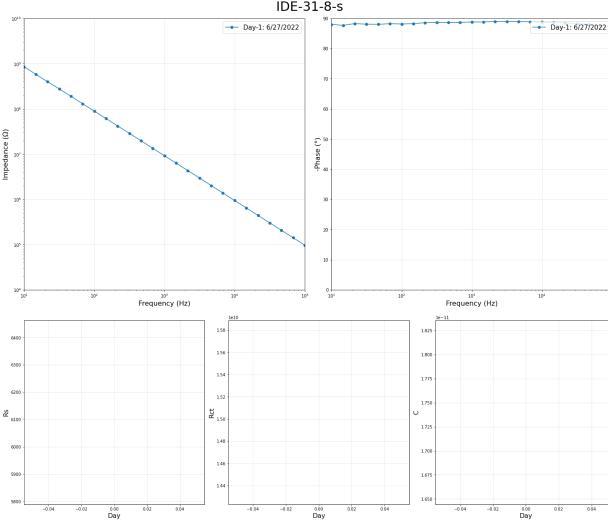












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