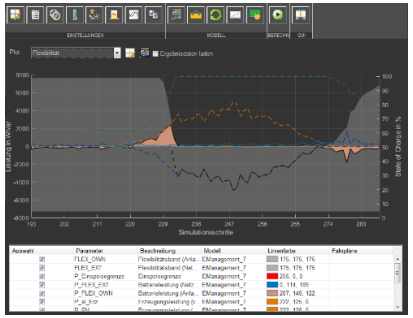
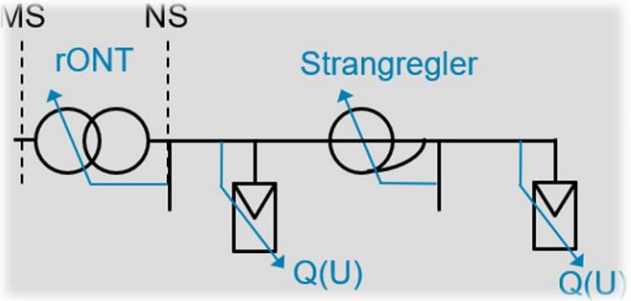
Modellierung innovativer, spannungsregelnder Netzbetriebsmittel

- (Bachelorarbeit) / Masterarbeit -

Motivation:

- Voranschreitende Kopplung des Stromsektors mit Wärme und Mobilitätssektor sowie Integration dezentraler Erzeuger führt zu zusätzlichen Belastungen in Verteilnetzen
- Konventionelle Netzverstärkung ist im Allgemeinen mit hohen Kosten verbunden
- Innovative Betriebsmittel wie regelbare Ortsnetztransformatoren (rONT) oder Strangregler können auftretende Spannungsprobleme im Niederspannungsnetz potentiell reduzieren






```
for i = 1 : self.get_size('trafo','net')
    %AUFGABE: Zeilen von result und mpc lokal speichern
    row_mpc = self.net.trafo(i).element.row_mpc;

    p_hv_kw = self.mp_result.branch(row_mpc,self.cols_mpc.branch.PF) * 1e3;
    p_lv_kw = self.mp_result.branch(row_mpc,self.cols_mpc.branch.PT) * 1e3;
    tap = self.mpc.branch(row_mpc,self.cols_mpc.branch.TAP);

    if self.options.ac == 1
        q_hv_kvar = self.mp_result.branch(row_mpc,self.cols_mpc.branch.QF) * 1e3
        q_lv_kvar = self.mp_result.branch(row_mpc,self.cols_mpc.branch.QT) * 1e3
        pl_kw = p_hv_kw + p_lv_kw;
        ql_kvar = q_hv_kvar + q_lv_kvar;
    else
        q_hv_kvar = 0;
        q_lv_kvar = 0;
        pl_kw = 0;
        ql_kvar = 0;
    end
```

Aufgaben/Ziele:

- Modellierung eines rONT (und Strangreglers) in MATLAB
- Gegenüberstellung und Integration verschiedener Regelkonzepte
- Simulative Validierung und Untersuchung der entwickelten Modelle in exemplarischen Anwendungsfällen

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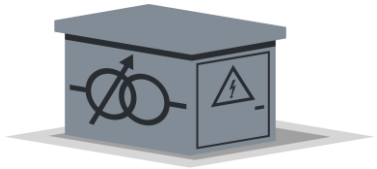

Voraussetzungen:

- Erste Erfahrungen in MATLAB erwünscht
- Eigenständige und zuverlässige Arbeitsweise unter Betreuung durch Wissenschaftliche Mitarbeiter
- Interesse an der Bearbeitung von mathematischen/technischen Schwerpunkten

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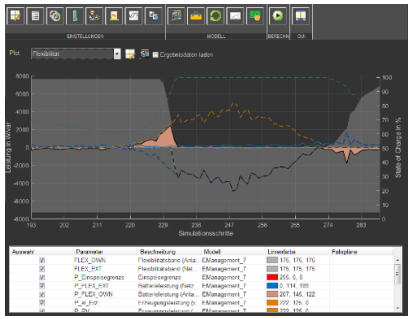
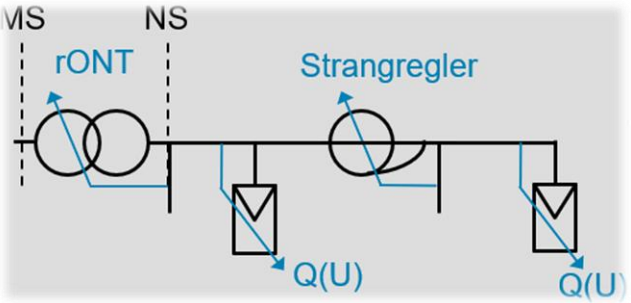
Modeling of innovative, voltage-regulating grid components

- (Bachelor thesis) / Master thesis -

Motivation:

- Advancing coupling of power sector with heat and mobility sector as well as integration of decentralized renewable resources leads to additional distribution grid stresses
- Conventional grid reinforcement is usually associated with higher costs
- Innovative equipment such as controllable local power transformers (rONT) or line regulators can potentially reduce voltage problems occurring in the low-voltage grid



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        q_lv_kvar = self.mp_result.branch(row_mpc,self.cols_mpc.branch.QT) * 1e3
        pl_kw = p_hv_kw + p_lv_kw;
        ql_kvar = q_hv_kvar + q_lv_kvar;
    else
        q_hv_kvar = 0;
        q_lv_kvar = 0;
        pl_kw = 0;
        ql_kvar = 0;
    end
```

Tasks/Goals:

- Modeling of a rONT (and line regulator) in MATLAB
- Comparison and integration of different control concepts
- Simulative validation and investigation of developed models in exemplary use cases

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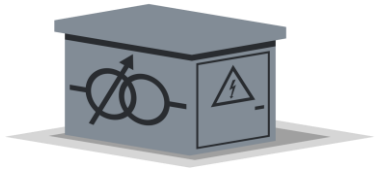

Prerequisites:

- First experience in MATLAB preferred
- Independent and reliable way of working under supervision of research associates
- Interest in working with mathematical/technical focus

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