

Explanation File for the Attached Software Codes (Active Content/Multimedia Material)

The manuscript “Model-based design for reactors of the modular multilevel converter” includes three parts source codes:

- A MATLAB software with a user-friendly GUI interface named as “MMCscIndDesignv1.mlaooinstall”. By inputting three categories of information, that is, the MMC’s ratings, protection speeds, and devices’ short-circuit capabilities, the software outputs a feasible region of reactor sizing which can limit the short circuit transient within the safe operating areas of the power semiconductor devices.
- The MATLAB program “LeqdcLeqacFeasibleRegion.m”. The program achieves similar functions to the previous software without installation.
- The MATLAB program “LeqdcLeqac2ArmInductanceConsideringMultipleConstraints.m”. This is the program of the reactor sizing with consideration of multiple constraints simultaneously, including short circuits, avoiding current resonance, operation range, and harmonics. The output generates the feasible parameters of the arm inductance L_o , AC inductance L_{ac} and DC inductance L_{dc} .

1. The Software “MMCscIndDesignv1.mlaooinstall”

How to use the app:

1-1) launch MATLAB software

1-2) click "APPS" tab

1-3) click "Install App"

1-4) find the location of the downloaded file

1-5) click the installed App "MMC_SC_IndDesign_v1" to use it

1-6) the GUI of the software is shown in Figure 1

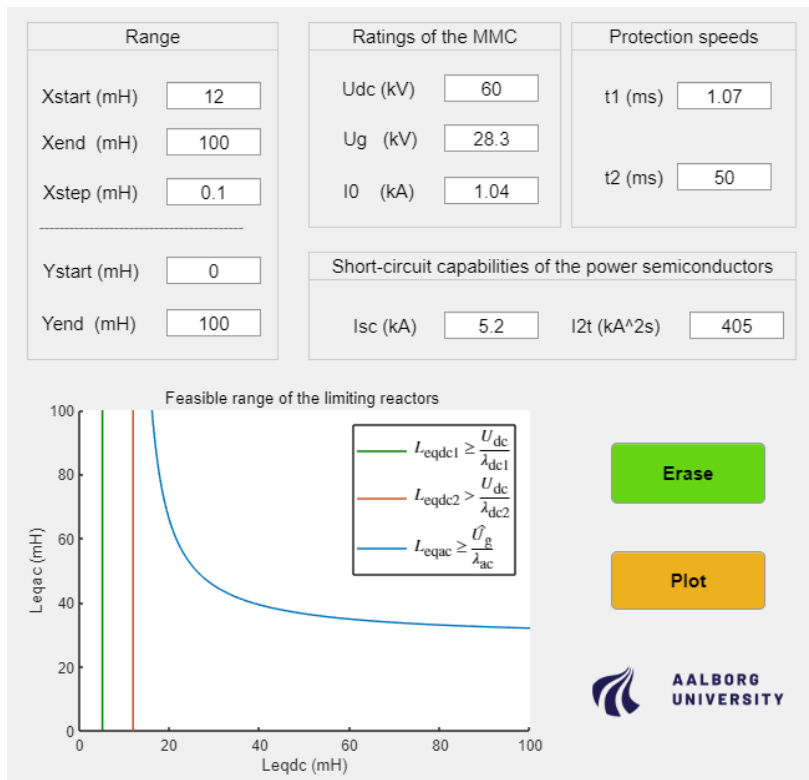


Figure 1 The GUI of the software to determine the feasible region of the limiting reactors

2. The MATLAB program “LeqdcLeqacFeasibleRegion.m”. The program achieves similar functions to the previous software without installation.

How to use the program:

2-1) launch MATLAB software;

2-2) run the program, the output is a plot as shown in Figure 2.

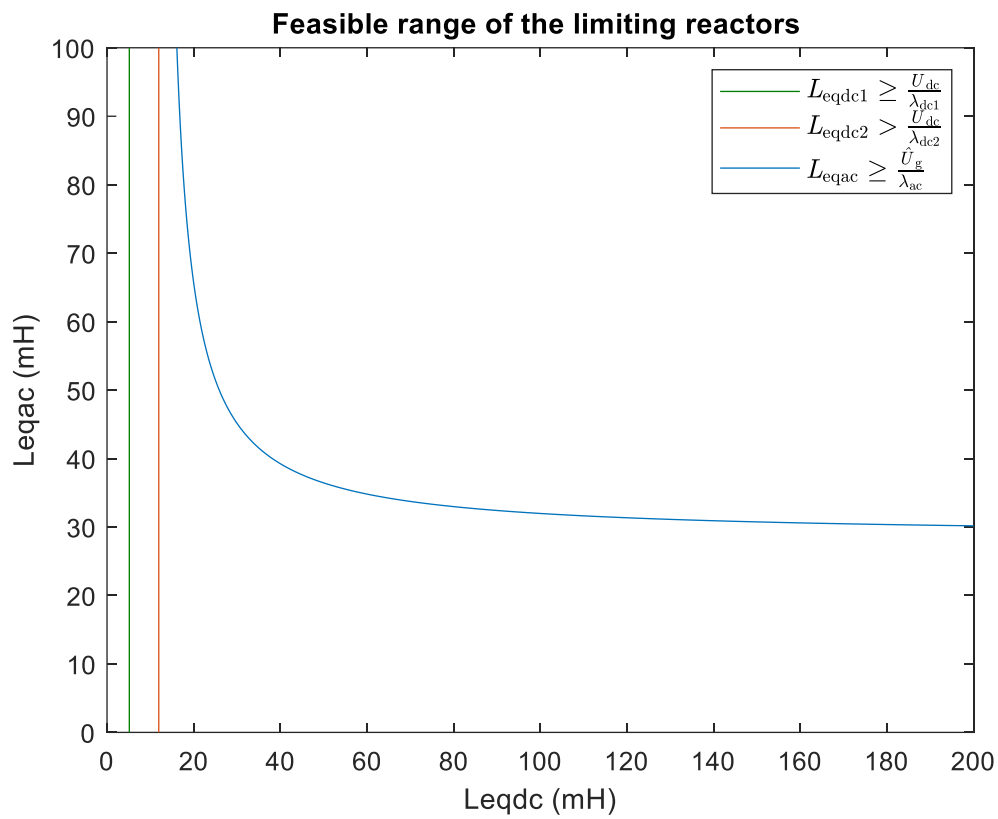


Figure 2 The output feasible region of the program “LeqdcLeqacFeasibleRegion.m”

3. The MATLAB program “LeqdcLeqac2ArmInductanceConsideringMultipleConstraints.m”

How to use the program:

3-1) launch MATLAB software;

3-2) run the program, the output is a plot as shown in Figure 3.

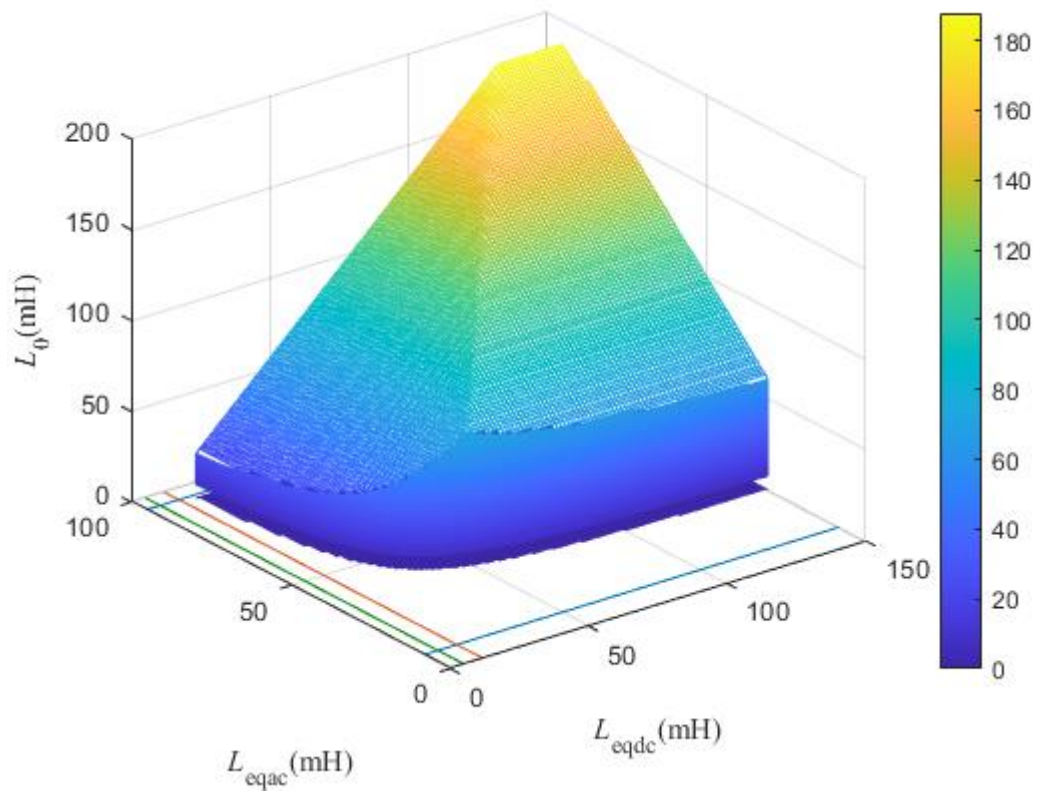


Figure 3 The output arm inductance considering multiple constraints