

HOMEWORK-1

So far, in the Power Electronics Circuits course, the basic analysis of single-phase rectifier types for low-power applications, along with voltage-current waveforms and harmonic effects on the grid, have been examined. For higher-power industrial applications, we encounter 12 or 24-pulse three-phase rectifiers. These rectifiers are commonly used in high-power applications as they achieve the highest possible transformer utilization factor for a three-phase system.

In this homework, create a basic simulation model in MATLAB/Simulink for both 6-pulse and 24-pulse three-phase rectifiers, capable of supplying a load with at least 50 kVA. Compare and analyze the harmonic effects on the grid for a resistive-inductive load, and discuss the strengths and weaknesses of increasing the number of pulses.

Due date: 02.12.2024 at 17:30

ABOUT THE HOMEWORK

- Please ensure that all work submitted is original and properly cited. Any form of plagiarism, especially copying or sharing work between students, is strictly prohibited and will be subject to disciplinary action.
- Submit your assignment with a cover page, formatted appropriately.
- You may prepare your assignment using MS Word or L^AT_EX.
- When presenting simulation outputs, transfer the data to the workspace and use the plot command to render them at a minimum resolution of 300 dpi.
- For formatting, you may use the IEEE Conference Template in a single-column layout.
- Don't forget to include references.
- Submitting your assignment on Ninova by the specified date and time is sufficient.