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► To cite this version:

Marouane Laaziz, Florentina Nicolau, Malek Ghanes, Nadia Machkour, Jean-Pierre Barbot, et al.. Flatness of the Three-Phase Grid Connected DC-AC Inverter with LCL Filter. The 2nd International Conference on Green Energy Conversion System: ICGECS 2023, 29 September - 1 October 2023, Djerba, Tunisia, Sep 2023, Djerba Island, Tunisia. hal-04522676

HAL Id: hal-04522676

<https://hal.science/hal-04522676>

Submitted on 25 Apr 2024

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Flatness of the Three-Phase Grid Connected DC-AC Inverter with LCL Filter

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Abstract. The three-phase inverter, connected to the grid by an LCL filter, is vulnerable to multiple faults, therefore an active fault-tolerant control is required to preserve the electrical power conversion between renewable resources and the grid. In this work, we provide a flatness analysis of the inverter and its LCL filter, the goal being to determine whether the flatness-based control structure stays accurate under both healthy and faulty circumstances.

Keywords: DC-AC inverter · Grid · Flatness analysis · Fault control.