ABSTRACT The article is focused on the analysis of the LCL resonant circuit, which operates under a discontinuous input current condition. This condition leads to the LCL topology variability phenomenon that drastically changes Inverter-LCL system properties. The LCL topology variability phenomenon is precisely described. The analytical analysis presents formulae that express converter features. The theoretical results are compared with laboratory tests. The concept of Controlled Variable Frequency Resonant Converter is presented. The principle of CVFRC operation is based on the LCL topology variability phenomenon. The CVFRC description is illustrated by simulation tests and the converter potential application area in the induction heating is indicated.

Keywords: resonant circuit LCL, resonant converter, topology variability, induction heating, voltage inverter control