Abstract:
The proportion of renewable energies in power generation has increased significantly in recent years according to the political aims. In low-voltage networks, these are mostly distributed intermittent generation systems such as photovoltaic systems that are connected through inverters to the network. Thus, the distribution networks have to meet hitherto unfamiliar technical challenges. A temporary reversal of the power flow can cause overvoltage problems. Traditional voltage regulation strategies cannot solve this problem. Consequently, regenerative sources need to be turned off temporarily or on the long term the network infrastructure has to be extended by the network operator. On-load tap changers (OLTC) offer the possibility to control the voltage in the entire network. This paper presents a control concept for OTLC in low-voltage distribution transformers. The proposed approach achieves sufficiently good voltage quality and enables the network operator to integrate more distributed generation. Moreover, a concept combining voltage control by both, OLTC and reactive power, as also presented in this paper offers various advantages.