

# **Fuzzy sliding mode voltage control for microgrid inverters in islanded mode with nonlinear load**

Kaveh Shayanfar\*, Mahyar Niroee,

**The main purpose of this work, is to propose a new method to control the micro-grid inverters using fuzzy sliding mode control (FSMC). A new solution is presented in terms of control structure which is based on inner closed loop system of adaptive third order sliding mode, virtual impedance outer loop and power control outer loop. Three results have been obtained: A) Micro-grid inverters effectively eliminate the voltage disturbances of the end loads, regardless the inverters or operating in grid connected mode, islanded mode or transient conditions, by using the fuzzy adaptive sliding mode control (FASMC). B) The virtual impedance outer loop is to making equivalent resistive impedance of the inverter output and to fulfillment of parallel performance in islanded mode conditions. C) The presented droop method, is to reducing the inductive impedance of the distribution lines and by using droop control coefficient factors, improve the power sharing of the units as well. The proposed method has been simulated in MATLAB/Simulink to demonstrate effectiveness of the control.**

**Keywords : inverter, sliding mode control, fuzzy, adaptive, droop control, micro-grid.**

[Islamic Azad University, Rasht Branch - Thesis Database](#)  
[دانشگاه آزاد اسلامی، واحد رشت - سامانه بانک اطلاعات پایان نامه ها](#)