Seminar

ZIP Load Model: Active and Reactive Power for Modern Loads

Dr. Rasim Doğan
Department of Electrical Engineering,
Afyon Kocatepe University
Turkey

Monday, February 3 2020, 15:00
DII-G – Saletta Gialla – 1st floor, via Gradenigo 6/A

Abstract: This study has been conducted for the purpose of developing load models for the residential subclasses. A series of voltage reduction tests were performed on residential appliances to observe their behavior under varying voltage conditions.
A quadratic curve fitting is performed on the test results in order to generate active and reactive ZIP coefficients for each appliances with three components: Constant impedance (Z), constant current (I), and constant power (P). ZIP coefficients are used for reconstructing active and reactive power behavior of the various residential subclasses. In order to verify the results, appliances for residential subclasses are assembled and tested in the power laboratory. The active power reconstructed data and test measurements are in agreement. However, it have been found that reactive power is different in important ways from the measured values. From this, it can be concluded that there is a problem with the definition of the reactive power (now called non-active power) in the IEEE Standards for nonlinear circuits.

Rasim Doğan received the B.Sc. degree in Electrical & Electronics Engineering from Gazi University, Ankara-Turkey, in 2008, the M.Sc. and Ph.D. degree in Electrical Engineering from the Polytechnic Institute of New York University, Brooklyn, NY-USA, in 2012 and 2015, respectively. In 2015, he joined the Afyon Kocatepe University, Afyonkarahisar-Turkey, where he is currently Asisstant Professor of Electrical Engineering. His research interests are power system load modeling, the calculation of electromagnetic fields applied to machine design and power electronics.