

## A NEW PV-NODE MODELLING FOR THE DISTRIBUTION SYSTEMS POWER FLOW ALGORITHMS

*Ulas Eminoglu<sup>1</sup>, M. Hakan Hocaoglu<sup>2</sup>*

*<sup>1</sup>Electrical and Electronics Engineering Department*

*Nigde University, Nigde 51425, Turkey*

*Phone (90) 388 2252352, Fax (90) 388 2250112*

*E-mail: ueminoglu@nigde.edu.tr*

*<sup>2</sup>Electronics Engineering Department*

*Gebze Institute of Technology, Istanbul Cad. No.101, Kocaeli, Turkey*

*E-mail: hocaoglu@gyte.edu.tr*

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### ABSTRACT

This paper demonstrates a new approach to incorporate Distributed Generation (DG) and controlled-Q sources such as; FACTS devices for distribution systems (D-FACTS) controllers as PV-Nodes into distribution systems forward/backward power flow algorithms. The proposed approach has been developed using bi-quadratic equation which is widely used for the node voltage calculations in distribution system load flow analysis. A number of distribution system forward/backward sweep-based algorithms are used and results are compared with conventional Newton-Raphson and Gauss-Seidel methods. The results demonstrate the validity and capability of the proposed method. It is also concluded from the results that the proposed method does not significantly affect the convergence characteristics of the distribution system load flow algorithms.