

A power flow solvability identification and calculation algorithm

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Abstract-

This paper presents a continuation and optimization based algorithm to detect power flow unsolvability. In addition, the algorithm obtains the power flow solution, if it exists, no matter how ill-conditioned the power system is. The proposed algorithm is based on the parameterization of the distance from the starting point to the real power flow to be solved, using a convergence margin. The performance of the algorithm is illustrated considering an highly loaded scenario of the operation of the Spanish power system.

Index Terms- Power flow solvability; Ill-conditioned systems; Convergence margin; Continuation; Optimization

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