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An eigenvalue sensitivity approach to location and controller design controllable series capacitors for damping power systems electromechanical oscillations

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Abstract-

This paper presents tools and methods to study the application of controllable series capacitors for damping power system electromechanical oscillations. Two problems are discussed: location and controller design. The location of a controllable series capacitor consists of determining the series capacitor of the power system where the modulation of its series reactance will be more effective to damp out the modes of interest. It also involves the selection of the input variable to the controller. The basic design o the controller require sthe design of the phase compensation network and the calculation of the controller gain. Small signal models of the power system and the corresponding eigenvalue sensititivies will be used to address both problems.

Index Terms- Flexible AC transmission systems, controllable series capacitors, small signal stability, eigenvalue sensivities, location, controller design

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