A Model Predictive Control Based Virtual Active Power Filter Using V2G Technology

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Abstract : This paper presents a virtual active power filter (VAPF) using vehicle to grid (V2G) technology to maintain power quality requirements. The optimal discrete operation of the power converter of electric vehicle (EV) is based on recognizing desired switching states using the model predictive control (MPC) algorithm. A fast dynamic response, lower total harmonic distortion (THD) and good reference tracking performance are realized through the presented control strategy. The simulation results using MATLAB/Simulink validate the effectiveness of the scheme in improving power quality as well as good dynamic response in power transferring capability.