Dynamic Characteristics Control of Pantographs Using Variable Stiffness Springs

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The authors proposed a new technique to improve current collection performance of pantographs. In this technique, the pantograph springs are replaced with variable stiffness springs. The stiffness of the variable stiffness spring is controlled so that the peak frequency of the compliance characteristics is consistent with the dominant disturbance frequency from overhead contact lines to pantograph. From some numerical simulation results, the technique has been appropriate to be effective. In this report, the authors present the second prototype of variable stiffness spring which has extended variability of the stiffness, and some experimental results of the stiffness control using the pantograph with the prototype spring.