Lateral suspension control of railway vehicle using semi-active magnetorheological damper

Abstract:

In railway vehicle technology, there are continuously increasing requirements regarding riding comfort, running safety, and speed of railway vehicles. These requirements are opposed by the fact that the condition of the tracks is getting worse and maintenance is becoming expensive. In view of this conflict, conventional suspension concepts are quickly at their limits. This paper investigates the performance of semi-active control of lateral suspension system namely body-based skyhook and bogie-based skyhook for the purpose of attenuating the effects of track irregularities to the body lateral displacement, body roll angle and unwanted yaw responses of railway vehicle. The controller is optimized on 17 degrees of freedom (DoF) railway vehicle dynamics model and showing better dynamics performance than its counterparts.