VIBRATION SUPPRESSION OF CONCRETE PUMP BOOM DURING PUMPING BY FEEDFORWARD CONTROL METHOD

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Keywords: truck-mounted concrete pump boom, vibration suppression, least mean square (LMS) algorithm, finite impulse response (FIR) filtering algorithm, simulation

In this paper, boom of truck-mounted concrete pump is taken as the research object. Firstly, both mathematical and simulation models of the boom system are constructed, then vibration characteristics of the boom, especially vibration state of pump truck chassis are analyzed. According to the results of these theoretical analysis, a feedforward control method based on least mean square (LMS) algorithm and the finite impulse response (FIR) filtering algorithm is proposed to suppress the vibration of truck-mounted concrete pump boom which is mainly caused by the operation of pump system. After that, proposed feedforward control method simulation model is established; the effect on vibration suppression performance of it is analyzed. According to the simulation results conducted under three typical operation conditions, acceleration at the end of the boom decreases by 39.3% ~ 52.0% after the feedforward control force is applied. Therefore, it can be seen that the adaptive FIR-based feedforward vibration suppression algorithms designed in this paper can effectively suppress the vibration at the end of the boom**.**

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