

This paper deals with the problem of controlling flexible link manipulators on the dynamic phase of the trajectory. A flexible beam/arm is an appealing option for civil and military applications, such as space-based robot manipulators. However, flexibility brings with it unwanted oscillations and severe chattering which may even lead to an unstable system. To tackle these challenges, a novel control architecture scheme is presented. First, a nonlinear controller based on the equation of motion of the robot is elaborated. Its aim is to produce a stable tracking control and dump the vibration of the links. Then, an adaptive cerebellar model articulation controller is implemented to compensate for structured and unstructured uncertainties. Efficiency of the new controller obtained is tested facing an important variation of the dynamic parameters of the manipulator. Simulation results on a dynamic trajectory with a high acceleration/deceleration ratio show the effectiveness of the proposed control strategy