Passive fault tolerant control of a double inverted pendulum - a case study

A passive fault tolerant control scheme is suggested, in which a nominal controller is augmented with an additional block, which guarantees stability and performance after the occurrence of a fault. The method is based on the YJBK parameterization, which requires the nominal controller to be implemented in observer based form. The proposed method is applied to a double inverted pendulum system, for which an $H_{\infty}$ controller has been designed and verified in a lab setup. In this case study, the fault is a degradation of the tacho loop.