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Comparisons of various fractional order controllers on a poorly damped system

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Abstract: Poorly damped systems exhibit a high oscillatory behavior making them harder to control. The paper explores the possibilities of controlling a poorly damped system using different fractional order control approaches such as the Fractional Order Internal Model Control (FOIMC) and the Fractional Order Proportional Integral (FOPI) controllers. The case study is chosen to be a highly nonlinear experimental platform consisting of a vertical take-off and landing platform. The performances of the closed loop systems with the two fractional order controllers are compared experimentally by analyzing reference tracking, disturbance rejection and robustness.

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