

Recently, many research works have focused on fractional order control (FOC) and fractional systems. It has proven to be a good mean for improving the plant dynamics with respect to response time and disturbance rejection. In this paper we propose a new approach for robust control by fractionalizing an integer order integrator in the classical PID control scheme and we use the Sub-optimal Approximation of fractional order transfer function to design the parameters of PID controller, after that we study the performance analysis of fractionalized PID controller over integer order PID controller. The implementation of the fractionalized terms is realized by mean of well-established numerical approximation methods. Illustrative simulation examples show that the disturbance rejection is improved by 50%. This approach can also be generalized to a wide range of control methods