

## Abstract

Fuzzy control is a practical alternative for a variety of challenging control applications since it provides a convenient method for constructing nonlinear controllers via the use of heuristic information. This approach provides a formal methodology for representing, manipulating, and implementing a human's heuristic knowledge about how to modeled and to control a system. This paper focuses on the application of fuzzy control approach to the surge phenomena in centrifugal compression system. Fuzzy controller is designed to consist of an active surge control and phase control without any explicit system models, but driven in the human thinking mechanism. This fuzzy control methodology suggested in this work reproduced well the main characteristics of the turbo compressor dynamic model developed by Moore and Gretzer and give place to a more precise and easy to handle representation. Application and simulation results are performed to demonstrate the effectiveness of this controller. Studies show that, the proposed controller provides good tracking control performance for the compression system at different operating conditions and moreover improves the dynamic performances of the system