

## ABSTRACT

---

The present work deals with modelling and linearizing a continuous stirred tank heater which has a strong nonlinearities. This apparatus is actually represents an important chemical industrial process. First a nonlinear dynamic model for a stirred tank heater process is developed. The model is represented a fifth-order lumped model. Then the tangential approximation method was employed to obtain the linearized model. The resulting model is a function of the operating point. A family of constant operating points was determined experimentally. Euler method is used also in the developing of a computer package in C-Language for the simulation of the model with the introduction of PID controller. Different optimization technique methods are used to determine the parameters of the controller for the simulated model with time delay. The optimum controller parameters are computed using a new technique, the optimum gain is related to the maximum gain for oscillation, but the optimum reset time and derivative time follow Ziegler - Nichols method for reaction curve.