

ABSTRACT OF THE DISCLOSURE

A frequency domain auto-tuning and continually adapting control regulating apparatus is applied to a linear stable process. A FFT based identification is applied to non-transformable samples of transient signals to obtain simultaneous and accurate multiple-point estimates of a frequency domain approximation of the process transfer function as an estimate of a frequency response. A linear least squares multiple-point-fitting process provides regulator design parameters. A multiple-point-fitting transfer function modeling process is disclosed, and an adaptive regulator design process is applied to compensate for changes in the process set-point or for load disturbances. In addition, techniques are provided for auto-tuning of multivariable regulators.

ABSTRACT**A FREQUENCY-DOMAIN ADAPTIVE CONTROLLER**

A frequency-domain adaptive controller is applied to regulate a linear stable process by auto-tuning and continually adapting control. A FFT based identification is applied to non-transformable samples of transient signals to obtain simultaneous and accurate multiple-point estimates of a frequency domain approximation of the process transfer function as an estimate of a frequency response. A linear least squares multiple-point-fitting process provides regulator design parameters. A multiple-point-fitting transfer function modeling process is disclosed, and an adaptive regulator design process is applied to compensate for changes in the process set-point or for load disturbances. In addition, techniques are provided for auto-tuning of multivariable regulators. (Fig. 6 is to be published)