Abstract

The circle theorem is one of the most important methods for study of absolute stability of nonlinear systems. In circle theorem, it is assumed that the nonlinearity term is located between linear bounds of a typical sector. In this paper the absolute stability of nonlinear systems with generalized sector condition is studied in which the bounds of the sector are piecewise linear in general. Therefore this method could be applied to the sector with nonlinear bounds. In this paper using modified Nyquist criterion, it is proved that the study of absolute stability of a nonlinear system using circle theorem could be reduced to the study of stability of equalized linear system. The aim of this paper is to define a pseudo circle region that the Nyquist plot of the linear system with nonlinearity in sector condition with piecewise bounds doesn’t have any intersection with that region and encircle it.

References


**Index Terms**

Computer Science  
Information Sciences

**Keywords**

Circle theorem, Lemma, Nonlinear systems