

A neutral fractional Halanay inequality and application to a Cohen-Grossberg neural network system

Mohammed Kassim¹ and Nasser-eddine Tatar²

¹Imam Abdulrahman Bin Faisal University

²King Fahd University of Petroleum and Minerals

February 27, 2021

Abstract

We extend the well-known Halanay inequality to the fractional order case in presence of distributed delays and delays of neutral type (in the fractional derivative). Both the discrete and distributed neutral delays are investigated. It is proved that solutions decay toward zero in a Mittag-Leffler manner under some rather general conditions. Some large classes of kernels and examples satisfying our assumptions are provided. We apply our findings to prove Mittag-Leffler stability for solutions of fractional neutral network systems of Cohen-Grossberg type.

Hosted file

manuscript.pdf available at <https://authorea.com/users/398483/articles/511088-a-neutral-fractional-halanay-inequality-and-application-to-a-cohen-grossberg-neural-network-system>