
Local stability analysis of differential equations with state-dependent delay

Eugen Stumpf*¹

¹Universität Hamburg - Department Mathematik – Bundesstraße 55, 20146 Hamburg, Germany

Abstract

In this talk, we discuss some aspects of the local stability analysis for a class of abstract functional differential equations. This is done under smoothness assumptions which are often satisfied in the presence of a state-dependent delay. Apart from recapitulating the two classical principles of linearized stability and instability, we deduce the analogon of the Pliss reduction principle for the class of differential equations under consideration. This reduction principle enables to determine the local stability properties of a solution in the situation where the linearization does not have any eigenvalues with positive real part but at least one eigenvalue on the imaginary axis.

*Speaker