

Applications of delay equations

Thomas Erneux (ULB, FNRS) 31/10/2008.

Delay differential equations describe the evolution of mechanical or physiologic systems where the time of a controlled or accidental feedback is taken into account. They appear in all areas of science and engineering but the approaches and objectives strongly differ depending on the background of the researcher. The goal of this talk is to introduce the applications of delay differential equations through several examples of current interest. It covers lasers subject to optical feedback, car following models, the delayed control of container cranes, postural control, and sleep disorders. From a mathematical point of view, it will insist on asymptotic rather than numerical approaches. They are the best techniques to determine information of physical interest.