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Webinar
Systems and Control Group - CIDMA

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Departamento de Matemática, Universidade de Aveiro

Mathematical modelling of some diseases related to water

Faïçal Ndaïrou

CIDMA, Department of Mathematics, University of Aveiro
faical@ua.pt

Abstract

This presentation focuses on the study of some infectious diseases dynamics from a double point of view: modelization and control. Precisely on some recent knowledge and investigation on the transmission dynamics of Ebola disease, Zika disease, Japanese encephalitis disease as well as COVID-19 [1, 2, 3, 4]. Our main aim is to formulate new mathematical models and combining them with existing ones in order to analyze the dynamics of diseases related to water. We consider compartmental models described by ordinary differential equations and perform rigorous qualitative and quantitative techniques for acquiring insights into the dynamics of these models.

[1] F. Ndaïrou, I. Area and D. F. M. Torres. Mathematical Modeling of Japanese Encephalitis Under Aquatic Environmental Effects. Mathematics, 8, 1880, 2020.
[2] F. Ndaïrou, I. Area, J. J. Nieto, C. J. Silva, and D. F. M. Torres. Mathematical modeling of Zika disease in pregnant women and newborns with microcephaly in Brazil. Mathematical Methods in the Applied Sciences, 41(18):8929–8941, 2018.
[3] F. Ndaïrou, I. Area, J. J. Nieto, and D. F. M. Torres. Mathematical modeling of COVID-19 transmission dynamics with a case study of Wuhan. Chaos Solitons Fractals, 135:109846, 2020. doi: 10.1016/j.chaos.2020.109846. Corrigendum Chaos Solitons Fractals 141 (2020), 110311 [https://doi.org/10.1016/j.chaos.2020.110311].
[4] I. Area, F. Ndaïrou, J. J. Nieto, C. J. Silva, and D. F. M. Torres. Ebola model and optimal control with vaccination constraints. Journal of Industrial & Management Optimization, 14(2):427–446, 2018.

Online session: `https://videoconf-colibri.zoom.us/j/87967088595`

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