Evento: Seminário LEMA (www.lema.isep.ipp.pt)

Data: 07 de Abril de 2015

Hora: 12h00

Local: Instalações do LEMA – ISEP, sala H211

Orador convidado: Sofia Lopes | Departamento de Matemática da Universidade do Minho

Público alvo: aberto ao público

Título:
Irrigation Planning: a new approach

Resumo

The most irrigation systems on sale in the market are based on the on-off control with no prediction techniques; the system triggers the irrigation cycle when a minimum critical value of soil moisture is detected and suspends it when a defined maximum is reached (sometimes close to saturation). We intend to develop an irrigation system in which soil moisture does not present abrupt variations in order to achieve an effectively minor water expenditure.

A careful planning of water needs, as opposed of unplanned strategies of water consumption, e.g. on-off irrigation systems, promotes significates water savings. This is achieved by implementing a smart strategy which uses data from the past and a prediction of future events.

The main goal of this study is the optimization of water use in the irrigation of farm fields by means of optimal control, where the model takes into account the evapotranspiration, percolation and runoff.

Optimal control is a tool of recognized efficacy in different areas such as robotics, air traffic control, energy systems management, biological systems or economic virtual systems, being able to simulate the economic consequences of the decisions of management. However, its use in the context of planning irrigation systems is not yet adequately studied.