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Title: Hydrodynamic-Sediment-Phosphorus interactions: A mathematical control approach

Abstract: Mathematical modelling is an effective tool for studying water quality in rivers or channels and reservoir management and operation. These models should include phosphorus transport (one of the key nutrients affecting eutrophication) and sediment particles (since most phosphorus in water are adsorbed by sediment particles and transported in the particulate phase).

In this talk we deal with a model that incorporates sediment-phosphorus interactions to the 1D hydrodynamic model. Our main aim is related to controlling water levels in order to optimize several possible objectives (hydropower generation, flood reduction, etc.) while minimizing nutrient concerns.

The first steps in modelling and optimization of this real-world problem will be shown in the talk. In the final part, other work topics that our research group has recently carried out will also be briefly discussed.

This is a joint work with Áurea Martínez (UVigo-Spain), Miguel E. Vázquez-Méndez (USC-Spain) and Néstor García-Chan (U. Guadalajara-México), funded by project "*Aplicaciones del Control y la Optimización a la Transición Ecológica y Digital*" (TED2021-129324B-I00), corresponding to our interuniversity team "*Grupo de Simulación y Control*" (https://gscpage.wordpress.com).