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**SEMINAR OF NUMERICAL ANALYSIS**

➤ **TUESDAY 15 MAY 2018 - ROOM MA A3 31 - 16:15**

**Dr Tommaso TADDEI** (Université Pierre et Marie Curie, FR) will present a seminar entitled:

**« An adaptive Parameterized-Background Data-Weak Approach  
to state estimation »**

Abstract:

We present an adaptive Parametrized-Background Data-Weak (PBDW) approach to the steady-state variational data assimilation (state estimation) problem, for systems modelled by partial differential equations. Given noisy measurements of the state, the PBDW state estimate consists of two components: the deduced background and the update. The background belongs to a low-dimensional linear space informed by a parameterized mathematical model, while the update is informed by the experimental observations. Model Order Reduction (MOR) techniques are employed to efficiently encode the prior knowledge coming from the parameterized manifold into a more manageable low-dimensional linear space.

In this talk, we present an adaptive procedure based on an error indicator to deal with noisy measurements, and we discuss the construction of the update. Furthermore, we investigate the case in which the domain of interest is a proper subset of the domain required for well-posedness of the mathematical model (localized state estimation). We present numerical results for synthetic problems in Acoustics and Fluid Mechanics, to illustrate the elements of the methodology and to prove its effectiveness.

Lausanne, 2 May 2018/FN/rb

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The seminars are announced at <http://mathicse.epfl.ch/seminars>