Combining advanced mathematical methods, IoT and High-Performance Computing to optimize energy in existing buildings

Christophe Prud'homme
Université de Strasbourg
christophe.prudhomme@cemosis.fr
Zohra Djatouti
Université de Strasbourg
zohra.djatouti@cemosis.fr
Vincent Chabannes
Université de Strasbourg
vincent.chabannes@cemosis.fr
Romain Hild
Université de Strasbourg
romain.hild@cemosis.fr
Yannick Stoll
Université de Strasbourg
yannick.stoll@cemosis.fr
Luc Kern
Synapse-Concept
l.kern@synapse-concept.com
Syphax Ikardouchene
Synapse-Concept
s.ikardouchene@synapse-concept.com

At a time of mass awareness of the impacts of climate change, mainly due to the increase in carbon emissions, reducing and controlling energy consumption are major challenges for the future. Taking up this challenge will help to contain the runaway rise in climate change. This partnership between Cemosis, the platform for collaboration between mathematics and industry at University of Strasbourg, and the company Synapse-Concept will speed up the identification of sources of energy savings in existing buildings by means of clustered calculations and will enable the effectiveness of the technical solutions proposed by architects and engineers to be virtually tested before any improvement work is undertaken. In this talk, we present an overview of the

mathematical and computational framework — coupling modeling simulation data assimilation, reduced order modeling and high performance computing — as well as some numerical results

Acknowledgments The authors are grateful for the support of the Region Grand Est and the Agency for Mathematics in Interaction with Enterprises and Society(AMIES).