

Report on the Outcomes of a Short-Term Scientific Mission¹

Action number: CA18232

Grantee name: Sahiba Arora

Details of the STSM

Title: Admissibility of positive infinite dimensional systems

Start and end date: 12/10/2023 to 25/10/2023

Description of the work carried out during the STSM

Description of the activities carried out during the STSM. Any deviations from the initial working plan shall also be described in this section.

(max. 500 words)

The purpose of this STSM was to study the admissibility of positive systems in infinite dimensions. During my stay, I also had the opportunity to interact with other members of the Faculty of Information Technology and Communication Sciences at Tampere University, in particular, Nicolas Vanspranghe.

During my stay, we focussed on the L^∞ -admissibility of the control operator and mainly tried to understand how positivity (of both the underlying semigroup and the control operator itself) plays a role.

Description of the STSM main achievements and planned follow-up activities

Description and assessment of whether the STSM achieved its planned goals and expected outcomes, including specific contributions to Action objectives and deliverables, or publications resulting from the STSM. Agreed plans for future follow-up collaborations shall also be described in this section.

(max. 500 words)

We discussed the Weiss duality result for admissibility and tried various techniques to obtain a generalization of the result to sun-dual spaces. We could already obtain partial results for certain implications and construct counter-examples to illustrate why the other direction might require a stronger assumption. At this point, it is important to mention that some work needed to be done even to obtain a reasonable claim. Furthermore, we could reprove a result of

¹ This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant.

Jacob-Schwenninger-Wintermeyr about the admissibility of the control operator without using the duality result on observation operators. This gave us a clearer picture of the assumptions of the theorem and in turn, prepare a work plan about how to weaken these assumptions.

During my stay, we even had a joint (virtual) meeting with Felix Schwenninger (Twente) which, as per our initial expectations, has been a first step towards a collaboration for a joint project