

Report on the outcomes of a Short-Term Scientific Mission¹

Action number: CA18232

Grantee name: Sahiba Arora

Details of the STSM

Title: Study of the Ornstein-Uhlenbeck semigroups on rooted trees

Start and end date: 20/10/2022 to 31/10/2022

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.

The purpose of this STSM was to continue a collaboration with the host Prof. Dr Abdelaziz Rhandi. During my stay, I also had the opportunity to interact with other members of the Department of Mathematics at the University of Salerno, in particular, Dr Federica Gregorio and Mohamed Fkirine.

During my stay, we discussed the properties of the usual Ornstein-Uhlenbeck semigroup that can be generalized to rooted trees. Moreover, the idea to show the ergodicity (and hence, uniqueness) of the invariant measure was discussed. Further, various possibilities for the possible eigenfunctions of the Ornstein-Uhlenbeck operator were considered.

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 contribution to Action objective and deliverables, or publications resulting from the STSM. Agreed plans for future follow-up collaborations shall also be described in this section.

We discussed the suitability of the idea to obtain an explicit formulation of the Ornstein-Uhlenbeck semigroup in the case of rooted trees, as was done by Mugnolo and Rhandi for star graphs.

Once the explicit description of the spectrum is ready, the next step would be to immediately conclude the desired results for the bi-continuous case. Afterwards, we will try to generalize our results for non-regular (rooted) trees. We expect that an article concerning the Ornstein-Uhlenbeck semigroup will be ready for submission in a few months.

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.