



Part II

IMU-CDC Individual Research Travel Support Program
Activity Reporting Form

Name of grantee: Manoubi Imen

Home institution and country of grantee: ISSAT, Gabes University, Tunisia

Name of the host: Olivier Goubet

Name of the host institution and country: Laboratoire PPL, Université Lille 1, France

Topic of the research activity: Stability of ground state solutions of some type PDE

Dates spend at the center/host institution: 05/01/2022 — 02/02/2022

During my stay at LLP laboratory, I studied in collaboration with Pr. Olivier Goubet a model of a non-standard-Schrodinger equation. This new direction in my research field is of importance due to the major applications of this model in several fields. I have the opportunity to present a talk at the Numerical analysis and PDE seminar. Moreover, I have different discussions with researchers in mathematics. In addition, I have regular meeting with my host to discuss different mathematical results. I did not advise any students or post-doctoral students. However, I did have interesting discussions with a post-doctoral student.

This research visit to U-Lille was an opportunity for me to work on a new research direction. First, I discussed with my host the stability and different properties of travelling waves for a regularized long wave model know as Benjamin-Bona-Mahony (BBM) model. Then we do a bibliography about the stability of ground states of the classical Schrodinger equation with several source terms. Then, we focused on the proprieties of the proposed model. We observed that the modified term led to a new characterization of the problem that cause a great difference with the classical one. Moreover, we have compared our work to those given in the literature (like Cazenave, JL Lions, A.H. Ardila, ...). We established some results in the power and the logarithmic cases. In addition, we have discussed the instability of the ground in higher dimensions (the work of Glassey as a reference).

We are seeking for a rigorous proof of the stability criteria of solutions with different source terms. This topic is challenging since classical methods do not work straightforwardly due to the non-invariance space translations criteria. We are completing a paper entitled "Stability for standing wave solution to non-standard Schrodinger equations.

As a future work, we planned to study the stability for ground state solutions in higher dimensions when considering critical cases.

Date: 10/02/2022

Signature Grantee: Imen Manoubi