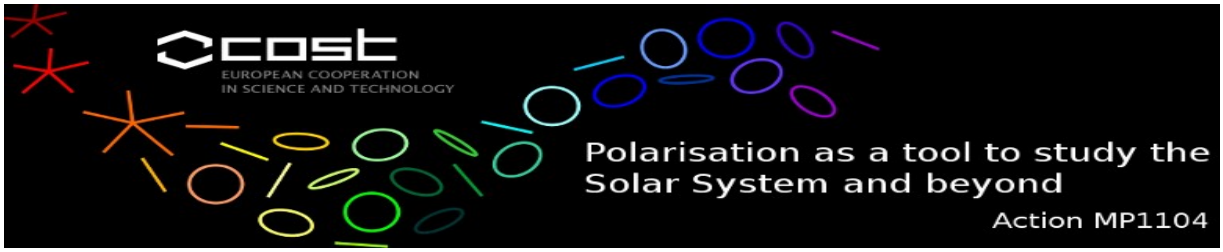

STSM Scientific Report

Applicant and home institution : Loïc ROSSI, LATMOS, France

Visited scientist and host institution : Daphne STAM, Technische Universiteit Delft, The Netherlands; Frans SNIK, Leiden Observatory, The Netherlands.

Dates of STSM : July 1st 2013 — July 5th 2013

Explain briefly below how your STSM matched one of these key-points :

1. strengthen current collaborative projects
2. establish new collaborations
3. obtain necessary knowledge for the application of new techniques
4. use host infrastructures that are not available at the home institute.

This STSM fulfilled several objectives:

— it helped develop the collaboration with Dr. Stam and Dr. Frans, which started during the 2013 EGU General Assembly;

— It allowed me to obtain a polarised radiative transfer code that can be applied to the SPICAV polarimetric observations of Venus;

— it gave us an opportunity to share ideas about Venus clouds and polarimetry, in particular when comparing SPICAV data and ground-based observations.

Describe below the activities carried out during the STSM and the main results obtained.

During the STSM :

- I presented Daphne and Frans an overview of SPICAV polarimetric measurements; we discussed the possible sources of error and uncertainties.
- We compared them with the ground-based observations performed by Frans and Michiel Rhodenhuis.
- Daphne Stam provided me with a Mie code along with a radiative transfer code, and taught me how to run it.
- I ran first tests of the codes on a two layers model, with a layer of hazes above a main cloud layer. I compared it with an orbit of Venus Express, to see if the main features, such as glories and variations of polarisation near the poles, were reproduced.
- I tested the impact of the optical depth on the model.

Main results:

- I now have codes to generate models of the clouds layers of Venus that I can compare with SPICAV observations.
- First tests of the code confirm that the main features observed with Venus Express, can be reproduced with the models.
- The optical depth of the layers is not enough to match precisely the observations. A mixing of the layers could be necessary.

Perspectives:

- Make more tests to find a more quantitative model of the cloud layers, in particular to find a model that can reproduce the latitudinal variations and the values of polarisation observed.
- As we want to compare space and ground-based observations, we plan to create sets of models and RT code output, that we could adapt to the different geometries of our observations.
- We also intend to pursue this collaboration on Venus polarimetric measurements.