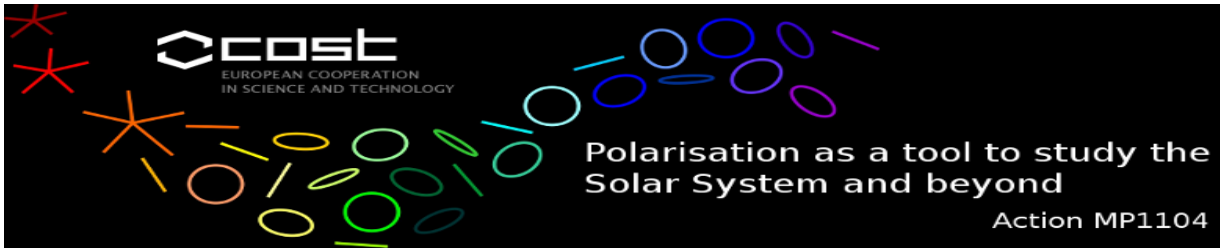

STSM Scientific Report Template

Applicant and home institution : Dr. Agnieszka Słowikowska

Visited scientist and host institution : Dr. Pablo Reig, Foundation for Research and Technologu – Hellas / University of Crete

Dates of STSM: 07.06.2014 – 14.06.2014

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.

During my visit at University of Crete I had strengthened scientific collaboration between our group and Cretan astrophysics group, especially Dr. Pablo Reig, Dr. Dmitry Blinov and Dr. Andreas Zezas. I was a post-doc at University of Crete in 2007-2009, and therefore visits at UoC help me to keep collaboration that was established during my fellowship. Since 2013 we are using existing host infrastructure, i.e. the Robo-Pol polarimeter, to conduct optical polarimetric observations of high mass X-ray binaries as well as of selected white dwarfs. There is no optical polarimeter available in Poland, and thus we do not have direct access to telescope equipped with polarimeter. Therefore, it is very important for us to keep and strengthen the collaboration between our two institutes.

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

Short summary of the activities

In May/June 2014 we have performed observations of 83 selected white dwarfs of DA and DB type at the Skinakas observatory with the Robo-Pol polarimeter, both isolated ones and those in binary systems. From preliminary analysis we found that there are eight white dwarfs with polarization degree above 1%, which constitute 10% of our whole sample and is in agreement with the population predictions. Four of polarised white dwarfs have PD between 1%-2%, one ~3%, one ~5.5%, one ~10% and one ~13%. We will investigate these objects more closely in the near future and will prepare dedicated observational proposals to investigate their nature with spectro polarimetric measurements. Additionally, in September / October this year we will continue our project and we will observe other 120 – 150 sources.

Second activity was connected with polarimetric observations and data analysis of a few selected high mass X-ray binaries with Be stars. All data obtained with the RINGO3 at the Liverpool Telescope between August 2013 and April 2014 have been already analysed. These sources are polarized from 1% up to 4%. Unfortunately, the RINGO3 polarimeter was not calibrated properly by the LT/RINGO3 team and therefore part of our data are not usable. After communication with the director of the Liverpool Telescope we got additional five hours of observing time to be used until August 31st, 2014. We see significant changes of polarization degree as a function of orbital phase for 4U 0115+634. Together with Dr. Krzysztof Krzeszowski we are developing a code to fit the polarimetric data to get the orbital parameters, especially the inclination angles, of the observed systems.