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Slovak-Bavarian collaboration on the development of telescope instrumentation

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Abstract. Within the project SLOBATCO (Slovak-Bavarian Telescope Collaboration) the Astronomical Institute of the Slovak Academy of Sciences and Aschaffenburg University of Applied Sciences collaborate in the development and commissioning of scientific instrumentation for the new ϕ1.3 m astronomical telescope at the Skalnaté Pleso observatory. The joint project is funded by the Bavarian Academic Center for Central, Eastern and Southeastern Europe (BAYHOST). Planned technical work packages are targeting the filter wheel software for the VIS camera, additional IR filters, and an upgrade of the mirror coating facility by additional sputtering equipment.

Key words: telescope – instrumentation – filter – camera – coating

1. Introduction

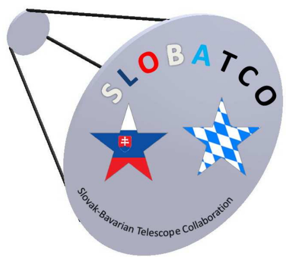

Figure 1. Logo of the SLOBATCO project.

The aim of the project SLOBATCO (Slovak-Bavarian Telescope Collaboration) is the effective combination of experience, expertise, and instrumentation of the Astronomical Institute of the Slovak Academy of Sciences (AI SAS) and

Aschaffenburg University of Applied Sciences for the development and commissioning of a new astronomical telescope and the corresponding scientific instrumentation. The bilateral project is funded by the Bavarian Academic Center for Central, Eastern and Southeastern Europe (BAYHOST). The logo of the SLOBATCO project is depicted in Fig. 1.

Thanks to a grant from the European Regional Development Fund (ITMS No. 26220120029) the Skalnaté Pleso observatory in Slovakia got a new 1.3 m telescope, shown in Fig. 2. The Stellar department of the AI SAS is currently installing this alt-azimuth Nasmyth-Cassegrain telescope (first light was in 2014) at its mountain observatory at Skalnaté Pleso (altitude 1783 m). The new telescope can be operated in a fully remote-controlled mode requiring minimum man-power. Corresponding advanced focal instruments for the new telescope are being developed as well. However, having only a small amount of dedicated staff at the observatory, the instrument development and improvement is a slow process. Therefore the Slovak team is very interested to get support from international partners.

Figure 2. The new 1.3 m telescope at the Skalnaté Pleso Observatory.

Aschaffenburg University of Applied Sciences is a dynamic and growing University of Applied Sciences in Germany; known for its innovative and interdisciplinary approach to education and its close links with the business world. Bachelor´s and Master´s degree programs are offered that have a strong practical focus within the fields of business, law, and engineering. Astronomy is the passion of the participating professors from the faculty of engineering sciences of Aschaffenburg University. Thus, direct access to a quite large professional astronomical telescope by using their technical know-how in an interesting field of research, is particularly motivating for them. So both partners decided to collaborate, proposed the bilateral project SLOBATCO, and finally got the requested funding from BAYHOST.

2. Timeline and research stays within the project

The granted project funding is dedicated to cover only travel expenses. Therefore the project timeline is mainly deflecting the planned visits. The milestones are set related to the two project meetings, one at the AI SAS, held at mid of September 2018 and one project meeting at Aschaffenburg University, held at the end of October 2018. The two bi-directional research stays within the project are illustrated in Fig. 3. A third milestone was the delivery of the final project report, to be submitted by the end of November 2018. Consequently, the project duration is scheduled from September 2018 till November 2018.

Figure 3. Research stays within the SLOBATCO project.

The two project meetings at the Skalnaté Pleso observatory and in Aschaffenburg were foreseen to form up a joint project team and to identify the technical work packages, which can be started within this project and executed within the intended future long-term cooperation. The partners will develop and exchange ideas on further project steps that will be the basis for additional joint funding proposals.

3. Potential technical work packages

Due to the limited financial resources and the limited duration of the project (September to November, 2018) the aim of the project was planning and setting up a specification of the intended future technical work. Up to now, two potential technical work packages have been already identified, covering the development needs for the telescope operation and also the technical expertise of the involved scientists (Döhring et al., 2006); (Pribulla et al., 2015).

3.1. Work package WP1

The large frame CCD camera, shown in Fig. 4, will benefit from the development of dedicated control software which will operate the external shutter and, in parallel, the filter wheel. Up to now, only one fixed filter (J passband) is available for the IR camera, but more specific filters are needed for the intended astronomical observations.

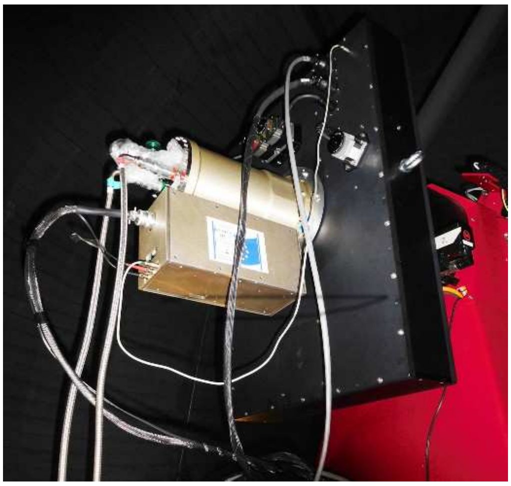

Figure 4. The VIS camera (on the left) with the corresponding filter wheel (black box).

3.2. Work package WP2

It is considered to improve the existing coating facility (see Fig. 5) by installing sputtering technology, especially needed for silver coatings of the primary mirror. Here the expertise of the scientists from Aschaffenburg University will be beneficial. They are operating similar equipment in their laboratory and could produce test coatings (Döhring et al., 2017).

4. Summary and outlook

Already in previous projects, Aschaffenburg University was successfully cooperating with Czech partners from the Czech Technical University in Prague (Hudec & Döhring, 2017). Cross-border networking of scientists and students within Europe will not only give progress to science, but there are also positive political implications with an impact on a prosperous economic development in both countries. Aschaffenburg University has the goal of internationalization as already written in its program. The SLOBATCO project is an excellent

Figure 5. The mirror coating facility at the Skalnaté Pleso observatory.

starting point for the intended long-term cooperation between the Astronomical Institute of the Slovak Academy of Sciences and Aschaffenburg University of Applied Sciences; those partners will also develop innovative ideas for future joint projects.

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