平成 29 年度共同利用研究・研究成果報告書

研究課題名　和文：CTA 大口径望遠鏡一号機設置運用

英文：Installation and commissioning of the first Large Size Telescope of CTA in La Palma, Canary Islands, Spain

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研究成果概要

The main purpose of the project was to install the first Large Size Telescope (LST1) of the Cherenkov Telescope Array (CTA) in La Palma, Canary Island, Spain. The final 3-D model of LST1 is shown in Figure 1.

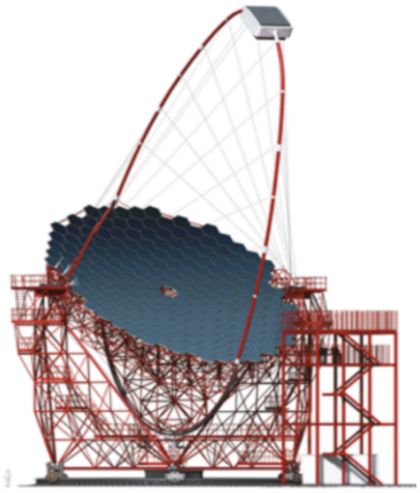

Figure 1: 3-D model of the LST telescope

The construction of the foundations started in August 2016 by the Spanish company Dragados and was finished by January 2017. Due to a delay in permission of the telescope construction by about 6 months, the works started in July 2017. First, rail and central pin was installed, then the bogies placed on top of the rail by end of August 2017 (Figure 2).

After that the company MERO started construction of the lower telescope structure and in parallel to it the assembly of the mirror dish next to it on the assembly area. The lower structure was ready in October, and the dish in November 2017. Finally, on December 5, 2017 the dish and the lower structure were joined (Figure 3). In December 2017 to February the back arch of the dish and the elevation drive were installed by the engineers of the Max Planck Institute for physics, Munich.

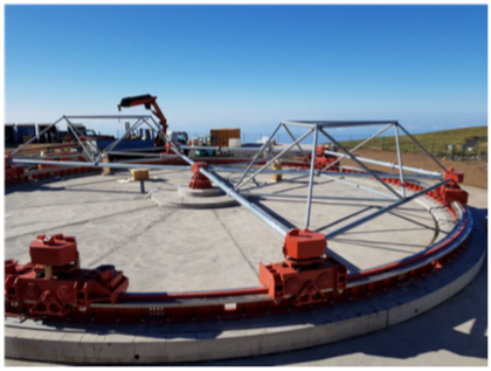

Figure 2: Rail and bogies

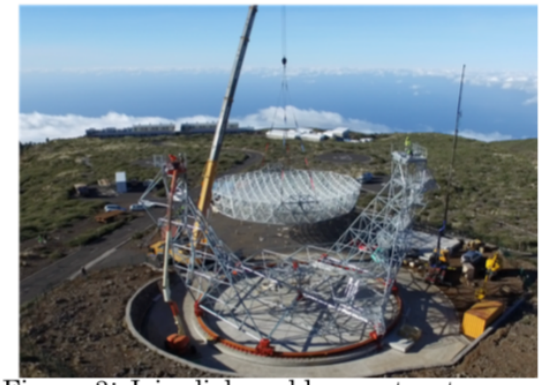

Figure 3: Join dish and lower structure

Figure 4: After ice storm Feb 2018

Figure 5: Mechanics is ready

In February 2018 the works had to be interrupted due to an ice storm over La Palma, which lasted several days. Once the storm passed and the clouds cleared, spectacular ice formations were left behind (Figure 4). After a careful inspection, the LST team was happy to learn that no damage was found in the telescope structure during the extreme conditions. Most of the ice melted in the following three days. After the storm a dummy counter weight, which is also called dummy camera support structure, was mounted on the dish to rotate the telescope into the parking position. This is needed for the installation of the interface plates and the mirrors. The telescope was rotated by mid February and the interface plates (interfacing the structure and the mirrors, produced in Japan) mounted. By the end of FY 2017 the telescope mechanics was completed and the telescope is ready for mirror installation (Figure 5).

It is planned to install the camera in September 2018 on the telescope and have the LST1 inauguration on October 10, 2018, coinciding with the first light. Then we start commissioning and prepare the telescope for the early physics studies.

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