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The readout and control system of the mid-size telescope prototype of the Cherenkov Telescope Array

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The Cherenkov Telescope Array (CTA) is one of the major ground-based astronomy projects being pursued and will be the largest facility for ground-based gamma-ray observations ever built. CTA will consist of two arrays: one in the Northern hemisphere composed of about 20 telescopes, and the other one in the Southern hemisphere composed of about 100 telescopes, both arrays containing telescopes of several sizes. A prototype for the Mid-Size Telescope (MST) with a diameter of 12 m has been installed in Berlin and is currently being commissioned. This prototype is composed of a mechanical structure, a drive system and mirror facets mounted with powered actuators to enable active control. Five Charge-Coupled Device (CCD) cameras, and a wide set of sensors allow the evaluation of the performance of the instrument.

The design of the control software is following concepts and tools under evaluation within the CTA consortium in order to provide a realistic test-bed for the middleware: 1) The readout and control system for the MST prototype is implemented with the Atacama Large Millimeter/submillimeter Array (ALMA) Common Software (ACS) distributed control middleware; 2) the OPen Connectivity-Unified Architecture (OPC UA) is used for hardware access; 3) MySQL databases are used for archiving the slow control monitoring data and operation configuration parameters storage; and 4) the document oriented MongoDB database is used for an efficient storage of CCD images, logging and alarm information. In this contribution, the details on the implementation of the control system for this MST prototype telescope are described.

Authors: Dr BEHERA, Bagmeet (DESY, Zeuthen); Mr MELKUMYAN, David (DESY, Zeuthen); Mr ANGUNER, Ekrem Oguzhan (Humboldt-Universitaet zu Berlin); Mr BIRSIN, Emrah (Humboldt-Universitaet zu Berlin); Dr OYA, Igor (Humboldt University); Dr FUESSLING, Matthias (Universtitaet Potsdam); Dr WEGNER, Peter (DESY); Mr STERNBERGE, Ronny (DESY, Zeuthen); WIESAND, Stephan (DESY); Dr SCHMIDT, Torsten (DESY, Zeuthen); Dr SCHWANKE, Ullrich (Humboldt University Berlin)

Presenter: Dr OYA, Igor (Humboldt University)

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