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Designing and prototyping the control system for the Cherenkov Telescope Array

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The Cherenkov Telescope Array (CTA) is the next-generation atmospheric Cherenkov gamma-ray observatory. CTA will consist of two installations, one in the southern (Cerro Armazones Chile) and the other in the northern hemisphere (La Palma, Spain). The two sites will contain dozens of telescopes of different sizes, constituting one of the largest astronomical installation under development. The CTA observatory will implement simultaneous automatic operation of multiple sub-arrays. It will be capable of quick re-scheduling of observations (within a few seconds), in order to allow observations of elusive transient events. The array control and data acquisition (ACTL) team within the CTA project is designing and prototyping the software to execute the observations and to handle the acquisition of scientific data at GB/s rates. The operation, control, and monitoring of the distributed multi-telescope CTA arrays is inherently complex. As such, they pose new challenges in scientific instrumentation control systems and in particular in the context of gamma-ray astronomy. In this contribution we present an update on the ACTL system design as it is being modeled via a tailored approach using elements from both the Unified Modelling Language (UML) and the Systems Modeling Language (SysML) formalisms. In addition, we present the status of the associated prototyping activities.

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