Contribution ID: **331**   Type: **Oral**

High-availability on-site deployment to heterogeneous architectures for Project 8 and ADMX

Thursday 7 November 2019 11:45 (15 minutes)

Project 8 is applying a novel spectroscopy technique to make a precision measurement of the tritium beta-decay spectrum, resulting in either a measurement of or further constraint on the effective mass of the electron antineutrino. ADMX is operating an axion haloscope to scan the mass-coupling parameter space in search of dark matter axions. Both collaborations are executing medium-scale experiments, where stable operations last for three to nine months and the same system is used for development and testing between periods of operation. It is also increasingly common to use low-cost computing elements, such as the Raspberry Pi, to integrate computing and control with custom instrumentation and hardware. This leads to situations where it is necessary to support software deployment to heterogeneous architectures on rapid development cycles while maintaining high availability. Here we present the use of docker containers to standardize packaging and execution of control software for both experiments and the use of kubernetes for management and monitoring of container deployment in an active research and development environment. We also discuss the advantages over more traditional approaches employed by experiments at this scale, such as detached user execution or custom control shell scripts.

Consider for promotion

No

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Session Classification: Track 7 –Facilities, Clouds and Containers

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