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Field deployment and iterative enhancement of the dish structure qualification (DiSQ) software for SKA-Mid

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As part of the construction of the SKA-Mid telescope in South Africa's Karoo desert, each of the 133 new mid-frequency radio dish structures, supporting a 15m diameter dish, must undergo a thorough qualification process before they are integrated into the array. To support this work, the SKAO Wombat team has developed the Dish Structure Qualification (DiSQ) software: a tailored suite of tools designed to interact with the dish structure's PLC-based control system via an OPC-UA interface. DiSQ comprises a user-focused engineering GUI, a synchronous Python API for automated testing with bespoke scripts, and a high-performance data logger that captures engineering parameters in HDF5 format. Since 2024, DiSQ has been successfully deployed during testing and commissioning activities by Dish Structure engineers, operating in the field on the first delivered dish structures. Its modular design enabled rapid adaptation to differences between simulation environments and real hardware, with updates informed by continuous feedback from SKAO and SARAO Dish Structure engineers. This paper presents the current status of DiSQ, highlights lessons learned from deployment, and details enhancements made to improve usability, resilience, and compatibility with evolving control interfaces. DiSQ's evolution exemplifies the value of iterative development and close collaboration between software development teams and end-users in delivering robust tools for complex scientific engineering tasks.

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Footnotes

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