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USING EPICS VARIABLES TO VISUALIZE THE CURRENT STATE OF ITER OBJECTS' DIGITAL MODEL IN REAL TIME *)

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ITER is one of the most complex and ambitious energy projects. The agreement on the construction and operation of the ITER reactor ensures access to experimental results for all project participants. For this reason, the data acquisition system of the facility is designed to enable remote access and participation in the experimental process. Through remote access to the ITER data acquisition system, operators at Remote Participation Centers worldwide can monitor the parameters of the facility and its technological systems as they change in real-time. This allows for the development of various methods for visualizing subsystem statuses, from creating specialized operator screens to employing the latest approaches with virtual reality technologies. The use of these technologies is an effective tool for the future operation of ITER.

The aim of this work was to test the functionality and effectiveness of using 3D visualization technologies for automation objects with elements of virtual reality. An application was developed to use real-time variables from the facility's data acquisition system to update the state of a 3D model and display it in real-time. During this project, various challenges and technical difficulties in development were resolved.

As a result, software was developed to operate a virtual reality application based on ITER's data acquisition system variables. At its current stage of development, the software enables direct retrieval of variables from ITER's unified data acquisition system, describing the status parameters of the crane system in the ITER tokamak assembly hall. Using the existing unified design model of the ITER tokamak, real-time modifications of the 3D model of the ITER assembly platform have been implemented, allowing tracking and visualization of the operation of the crane lifting mechanisms.

The approach used demonstrated the effectiveness of the applied methods for 3D model correction and will be utilized for further development of remote access and 3D visualization technologies for ITER's automation and control objects.

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