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Application of LHD Post Data Analysis Systems to the KSTAR Project

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The authors have been porting post data analysis systems used for the LHD project to the KSTAR project. The first one is AutoAna, or Automatic Analysis System. It is a system to manage programs to produce physical data for the LHD experiment. All the physical data for the LHD experiment is stored in the Kaiseki Server, or Analysis Server. Until the end of the fiscal year 2018, the Kaiseki Server handles 800 diagnostics, and the total number of the physical data is about 12 million. There are dependencies among these diagnostics, and physical data of some diagnostics are calculated from other diagnostics data. For example, in order to execute the transport analysis programs, it requires various source data, such as the distribution of electron temperature and pressure. Sometimes, these source diagnostics data may be modified, because of correction of diagnostics devices or modification of the programs. When one data is modified, it is required to recalculate all the physical data that use the modified data as source data. AutoAna automatically executes the calculation programs to keep the dependencies among the physical data. When one data is registered into the Kaiseki Server, it checks if there exists physical data that uses the newly registered data. If such data exists, AutoAna starts the analysis programs to produce the dependent data. AutoAna is also useful for the post data analysis because it runs the analysis program right after the necessary data is available. A typical LHD experiment is a repetitive plasma discharge experiment carried out every 3 miniates. Within the short break of the repetition, the AutoAna provides the important information of the on-going experiment.

The other system is MyView2. MyView2 is a python-based data visualization tool, and it has developed mainly for the visitors so that they can use MyView2 to retrieve and analyze the necessary data for their study soon after they arrive at NIFS. Because it is written in Python, it supports various OS such as MacOS, Windows and Linux. Therefore, the visitors can run MyView2 in the computers that vistos bring. The graph layout and the data source can be flexibly customized using a GUI operation. However, using the configuration files prepared in advance, the visitors don't bother customizing MyView2 to visualize the necessary data.

Basically, both AutoAna and MyView2 are developed so that they can be used for generic experiments and do not depend on LHD experiment too much, they can be relatively easy to use for other experiments. By porting to the KSTAR project, the authors demonstrate the utility of the tools for other experiments.

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