Contribution ID: **166** Type: **Oral Presentation**

From Batch to Interactive: Interactive Analysis Workbench for HEP Data Analysis at IHEP

Friday, 20 March 2026 11:40 (25 minutes)

The IHEP computing platform is facing new demands in data analysis, including restricted access to login nodes, increasing needs for code debugging tools, and more efficient data access for collaborative workflows. To address these challenges, we have developed INK, a web-based "Interactive aNalysis worKbench" that enables users to access IHEP login nodes, cluster computing resources, and data directly through their browsers. INK also allows users to create both general-purpose analytical web applications and experiment-specific customized applications, making it easier to utilize IHEP's computing resources. The INK system adopts a decoupled front-end/back-end architecture and provides multi-source user authentication and authorization mechanisms for heterogeneous computing and data resources. A set of unified interfaces is exposed to the front-end, ensuring consistent environments while enabling seamless integration with interactive analysis tools.

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Session Classification: Virtual Research Environment (VRE) - II

Track Classification: Track 5: Virtual Research Environment (including tools, services, workflows, portals, ... etc.)