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SPD Online Filter High-Throughput Processing Middleware

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The SPD Online Filter is a specialized data computing facility designed for the high-throughput, multi-step processing of data from the SPD detector. Its primary objective is real-time data reduction to minimize storage requirements and enable downstream analysis. The system combines a compute cluster with middleware that abstracts hardware complexity from the applied software.
This report details the system's architecture and illustrates how the platform is designed to meet the SPD experiment's demands for scalability, throughput, and operational resilience during real-time data processing. The system accomplishes this by coordinating data management, workflow orchestration, and workload management.

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