

New Developments in File-based Infrastructure for ATLAS Event Selection

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In ATLAS software, TAGs are event metadata records that can be stored in various technologies, including ROOT files and relational databases. TAGs are used to identify and extract events that satisfy certain selection predicates, which can be coded as SQL-style queries.

Several new developments in file-based TAG infrastructure are presented.

TAG collection files support in-file metadata to store information describing all events in the collection. Event Selector functionality has been augmented to provide such collection-level metadata to subsequent algorithms.

The ATLAS I/O framework has been extended to allow computational processing of TAG attributes to select or reject events without reading the event data. This capability enables physicists to use more detailed selection criteria than are feasible in an SQL query. For example, the TAGs contain enough information not only to check the number of electrons, but also to calculate their distance to the closest jet—a calculation that would be difficult to express in SQL.

Another new development allows ATLAS to write TAGs directly into event data files. This feature can improve performance by supporting advanced event selection capabilities, including computational processing of TAG information, without the need for external TAG file or database access.

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