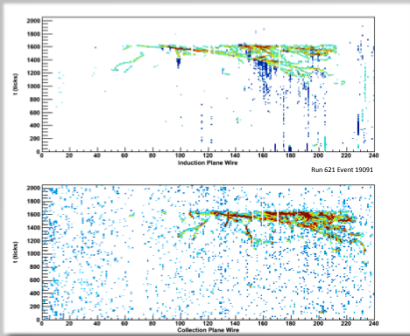# Grid Data Management for Liquid Time Projection Chamber Data Analysis

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Physics data objects

Liquid Argon Time Projection Chamber events are recorded as 2-Dimensional images at the Laboratory of High Energy Physics of the University of Bern:

- **Cosmic muons**
- **Radioactive sources**
- **Laser**
- **LArSoft simulations**
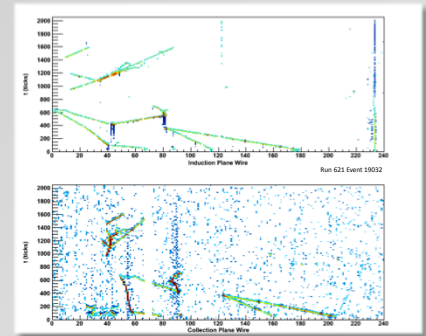
Data Management and goals

- **Data recorded on DAQ servers in proximity of readout electronics (limited access)**
- **Move to a durable data storage facility for remote secure access and retrieval by physicists at participating institutes:**
- **E-learning, Masterclasses: event image display via a web browser**
- **Visual event inspection and selection for a specific physic process of interest from a web interface**
- **Event analysis, reconstruction (LArSoft)**
- **Automated event selection: Content Based Image Retrieval (CBIR) based on the GNU Image Finding Tool (GIFT)**

Why grid technologies?

Ensure secure and transparent remote data access for collaborators owing the correct credentials:

- **Virtual Organisation Membership Service (VOMS) and the X.509 Public Key Infrastructure. Offers the authentication and delegation mechanisms provided by the Globus Toolkit Grid Security Infrastructure (GSI)**
- **LTPC Virtual Organisation**
- **Disk Pool Manager (DPM) gLite Storage Element: durable storage platform, GSI-enabled**
- **The CPU-intensive image discrimination processing requires access to extended computing resources: the Swiss Multi-Science Computing Grid (SMSCG)**

1. User issues myproxy-init
2. Login with credentials on web portal
3. Webserver retrieves proxy
4. Webserver retrieves data from SE