

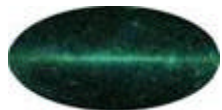
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# L1 Database Contents

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**HEPL/Stanford Univ.**

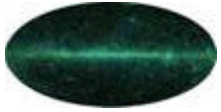
**16 July 2003**



# Outline

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- **Why have this talk?**
- **Contents of L1 event summaries**
- **What might we need to add**
- **What we might do without**



# Why have this talk?

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- The L1 database is intended to contain the summary information for each event, what might be useful for high-level analysis
- The needs for the standard analysis environment are simple
  - Event number, time, energy, direction, zenith angle, classification flags
- For use outside the SAE, some additional quantities can be anticipated as being useful
  - This is kind of a slippery slope – intent is not to facilitate second guessing the reconstruction, for example
- Current set is kind of a grab bag of ideas that have been floated over the last 3 years



# Current contents of the L1 data

- Names and comments extracted from June 27 version by the LAT FITS group, posted by Masa Hirayama
- Highlighted in **red** are the must-have quantities (for DC1 and afterward)
- Quality parameters are not defined, or their application in higher-level analysis

Value	FITS Comment
<b>ENERGY</b>	energy of event
ENERGY_UNC	estimated 1-sigma uncertainty of energy
<b>RA</b>	right ascension (J2000) of event
<b>DEC</b>	declination (J2000) of event
DIRECTION_UNC	localization uncertainty, estimated 1-sigma radius
<b>ZENITH_ANGLE</b>	zenith angle of event
EARTH_AZIMUTH_ANGLE	Earth azimuth (from north to east) of event
<b>TIME</b>	Mission Elapsed Time
<b>EVENT_ID</b>	ID number of original event
OVERALL_QUALITY	overall quality parameter; overall status of event
SUBSYSTEM_FLAG	indicates subsystem(s) of conversion and tracking
MULTI_EVENT_FLAG	indicates whether multiple events reconstructed from same trigger
RECON_NUMBER	number of event within multi-event reconstructions
<b>QUALITY_PARAMS</b>	<b>event quality parameters for fitted trajectory, bit flags</b>
CONVERSION_POINT	reconstructed 3-space conversion point in instr. coords.
CONVERSION_LAYER	conversion layer in TKR, -1 means not in TKR
PRIMARY_TRAJECTORY	reconstruction trajectory; direction cosines (instr. coords) of photon
SEC1_TRAJECTORY	reconstruction trajectory; direction cosines (instr. coords) of secondary 1
SEC2_TRAJECTORY	reconstruction trajectory; direction cosines (instr. coords) of secondary 2
SEC_ENERGIES	energies of secondaries
TKR_HITS	number of hits in TKR
HITS_NOT_RECON	number of hits in TKR not used in reconstruction
ACD_TILES_HIT	bit flags for ACD tiles hit
<b>RECON_VERSION</b>	version of event reconstruction software
<b>CALIB_VERSION</b>	versions of calibration tables for the ACD, CAL, TKR



# What's missing and might be needed?

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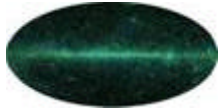
- **Geomagnetic coordinates, McIlwain L, B**
- **Particle identification (gamma ray, electron, etc.)**
- **Event classification**
  - **Bill Atwood's work is currently classifying events based on CAL (No, Low, High), conversion location (Thin, Thick), and tracking (Vertex, Single Track).**
  - **These basic distinctions already multiply up to 12 event classifications**
- **Coordinates in other systems**
  - **Moon-centered, sun-centered, for example (or face question of how to analyze a moving source – solar system-type – in general)**
  - ***l,b?***



## What might be needed? (2)

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- **Measured quantities and uncertainties**
  - Incorporating uncertainties is certainly desirable, especially for export of the data outside of the SAE
  - However, characterizing the uncertainties short of providing the response functions is perhaps problematic – errors are not gaussian



# What can we omit?

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- **Information about secondaries?**
- **Information for multi-gamma events?**
  - Will these really be reconstructed?
  - Will these be common enough to worry about?
- **Hits not reconstructed?**
  - Are there better ways to warn that an event was particularly noisy?