



Event

X-ray astronomy instruments record a separate signal from every individual photon they detect. This is unlike typical optical CCDs (for example WF/PC2 on Hubble Space Telescope) which need to integrate the signal from a number of photons to generate a detectable signal. As a result X-ray data is stored event by event, which retains more information and allows great flexibility of analysis.

Every X-ray "event" (a general term for a detection; may refer to a photon or a background cosmic ray) is characterized by: a "pulse height" (**PHA**) that encodes the energy of the incoming photon; a time; a grade, and typically two position coordinates. The large amount of information for each event, allows rather complex and sophisticated analysis. For example, a user may wish to exclude events which occurred during a period of high background, and then display the events as a spectrum vs. time image. Such multi-dimensional analysis is common to X-ray astronomy.

Retaining the individual events also retains the Poisson ("counting statistics") nature of the data, and so allows the statistical significance of sources or features to be assessed more readily.

For more details on the contents of a Chandra event file, visit the [Data Products Guide](#).

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URL:
<http://cxc.harvard.edu/ciao3.4/dictionary/event.html>
Last modified: 15 December 2008

Dictionary Entry - CIAO 3.4