

NEWNET

**Ionizing Radiation Source
Analysis**

Purpose

- To compare observed gamma radiation spikes with various possible sources

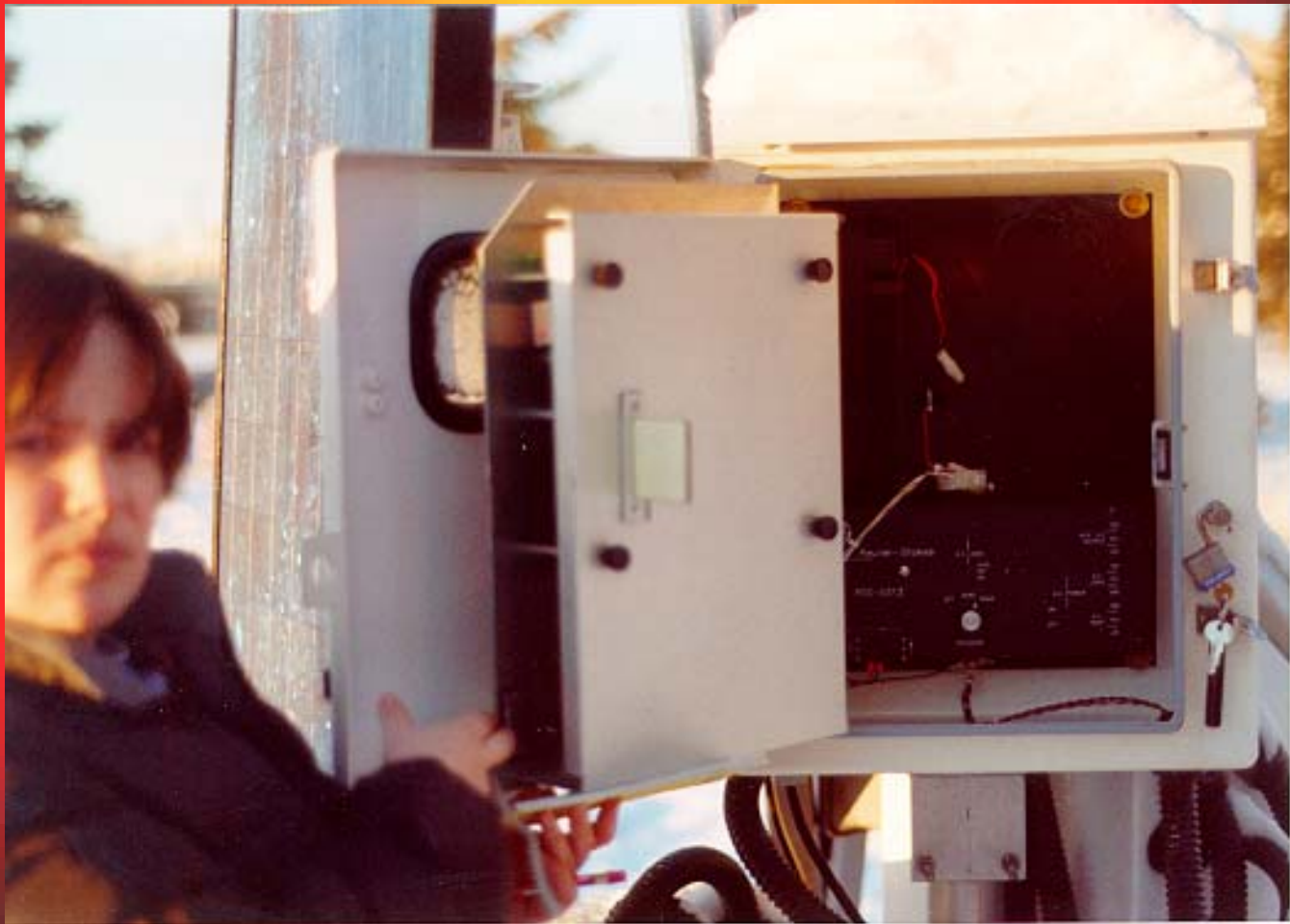
Process

- Data Collection
- Data Analysis
- Source Analysis

Data Collection

- Memory Cartridge
- Download Process

Memory Cartridge installed in 1013



Memory Cartridge

- Allows data collection over a desired period of time
- Only collects gamma radiation data
- Time intervals can be set anywhere from 5 second readings to 1 hour averages
- Maximum capacity is approx. 64,000 data points

Download Setup



Download Process

- Downloads occur when cartridge capacity is reached
 - 5 second readings → approx. 3 and half days
 - 15 second averages → approx. 12 days
- Data is downloaded into a text file

Raw Data

2 51894 00005

1 12/20/79 1:34:15

0 .0073 .0073 .0076 .0077 .0077 .0081 .0081 .0088 .0076 .0070

0 .0071 .0073 .0076 .0078 .0073 .0077 .0072 .0075 .0078 .0080

0 .0072 .0073 .0071 .0071 .0067 .0072 .0077 .0078 .0077 .0081

0 .0076 .0085 .0078 .0077 .0081 .0081 .0080 .0076 .0078 .0077

0 .0086 .0085 .0081 .0082 .0080 .0076 .0078 .0087 .0090 .0085

0 .0086 .0077 .0077 .0075 .0083 .0086 .0080 .0072 .0072 .0078

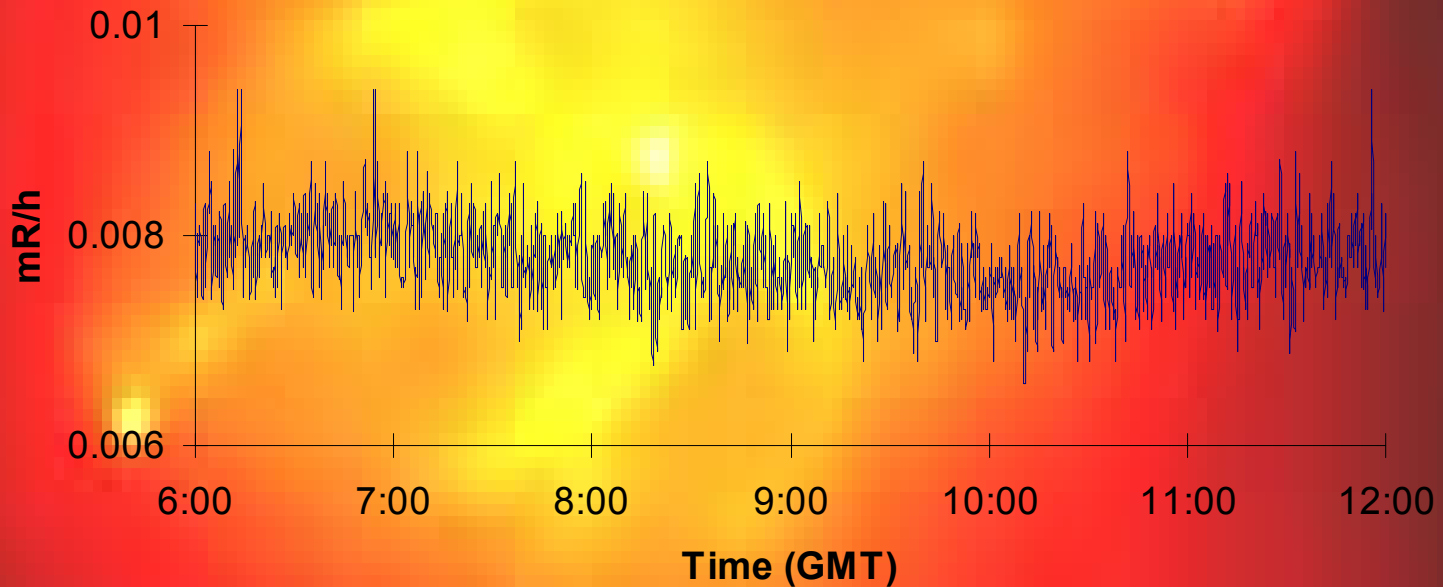
0 .0075 .0077 .0076 .0070 .0077 .0080 .0075 .0075 .0073 .0076

0 .0080 .0073 .0083 .0075 .0077 .0083 .0086 .0080 .0080 .0081

4

Data Analysis with Excel

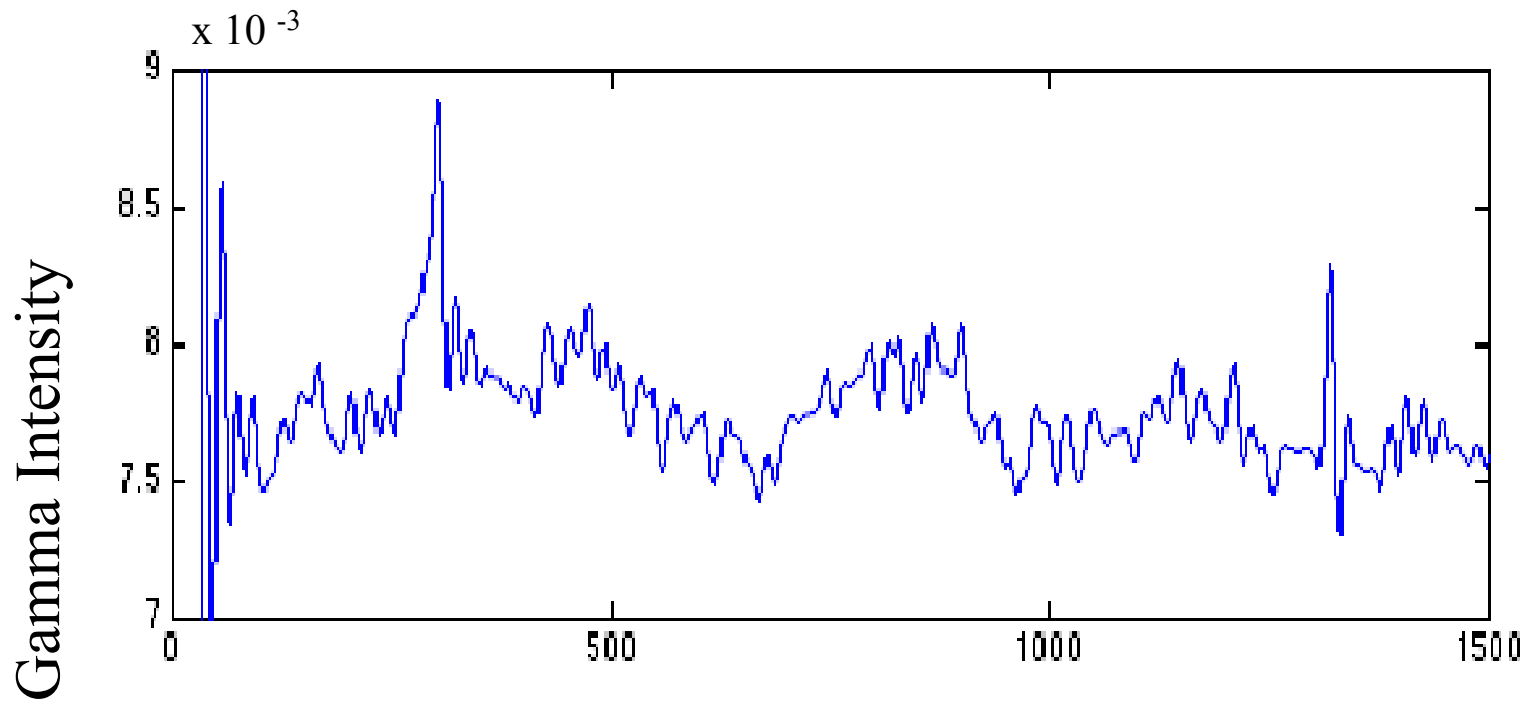
**15 Second Averages
Fairbanks, Alaska
08/18/2000**



Data Analysis with Matlab

- Data is imported into Matlab for filtering and analyzing

Filtered Gamma Data



18 Aug 2000, Gamma Vs. X-Ray Data

Source Analysis

Radiation spikes are compared with other geophysical data:

- Rain
- Long and short wave x-rays

X-ray Data

Modified Seconds

UT Date	Time	Julian	of the			
YR MO DA	HHMM	Day	Day	Short	Long	Ratio
20000812	0000	51768	0	2.55e-08	1.44e-06	1.77e-02
20000812	0005	51768	300	1.10e-07	2.32e-06	4.71e-02
20000812	0010	51768	600	7.06e-08	2.23e-06	3.17e-02
20000812	0015	51768	900	6.01e-08	2.10e-06	2.87e-02
20000812	0020	51768	1200	4.46e-08	1.93e-06	2.30e-02
20000812	0025	51768	1500	2.76e-08	1.70e-06	1.62e-02
20000812	0030	51768	1800	2.05e-08	1.54e-06	1.33e-02
20000812	0035	51768	2100	2.09e-08	1.56e-06	1.34e-02

Long Wave X-Ray Data

