

Proposal for Experiment: Laura, Orlando, & Bala

1. Title: Correlation of K_p index to Cosmic Rays Incidence
2. Justification: To determine if solar variations influence the reception of cosmic rays upon the surface of the earth, specifically to observe any residual effects of an early AM geomagnetic storm that hit this morning (Tuesday July 31, 11AM).
3. References: swpc.noaa.gov (find event summary plots, which will lead to text plots with time and intensity of solar flares) and DOE's cosmic ray data.
4. Hypotheses:
 H_0 : There is no correlation ($\alpha=0.10$) between K_p index and cosmic ray incidence.
 H_1 : There is significant correlation ($\alpha=0.10$) between K_p index and cosmic ray incidence.

Goals:

- a. To observe any residual effects of a geomagnetic storm that occurred early AM Tues 7/31 11AM upon cosmic rays.
- b. To collect cosmic ray data over a twenty four hour period with small CRD's, capturing data with webcam.
- c. To access data of solar activity from several reliable sources.
- d. To compare times of peak solar activity with peak cosmic ray activity.

5. Experimental Details:

a. MATERIALS:

- i. 1 small CRD
- ii. 1 ThinkPad laptop equipped with Webcam, Debut Video Capture Software, Microsoft Office components (including Word, Excel, Internet Explorer, and PowerPoint), Internet connection
- iii. Room where equipment can be set up with no disturbance to equipment or background interference.

b. Methods

- i. Place equipment in secure portion of classroom on floor out of way, set up so that paddles are at a 90° angle to the vertical.
- ii. Power on Laptop, load Debut Video capture and point camera at count display of CRD.
- iii. Power on CRD, with settings as follows:
 1. Buzzer off
 2. Coincidence
 3. Infinite Count mode
 4. Clear, set to zero
- iv. Record initial time as we start video, then turn on the count mode and start CRD apparatus
- v. Run apparatus for 12-18 hours, then stop.
- vi. SAVE video capture.
- vii. Analyze data

Layout of experimental apparatus:

