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## Team: Magneto Bf-V

The purpose of our experiment is to test two instruments that we will validate for Balloon Fest in May 2008:

Vernier Magnetic Field Sensor [Order Code MG-BTA]  
Vernier Barometer [Order Code BAR-BTA]

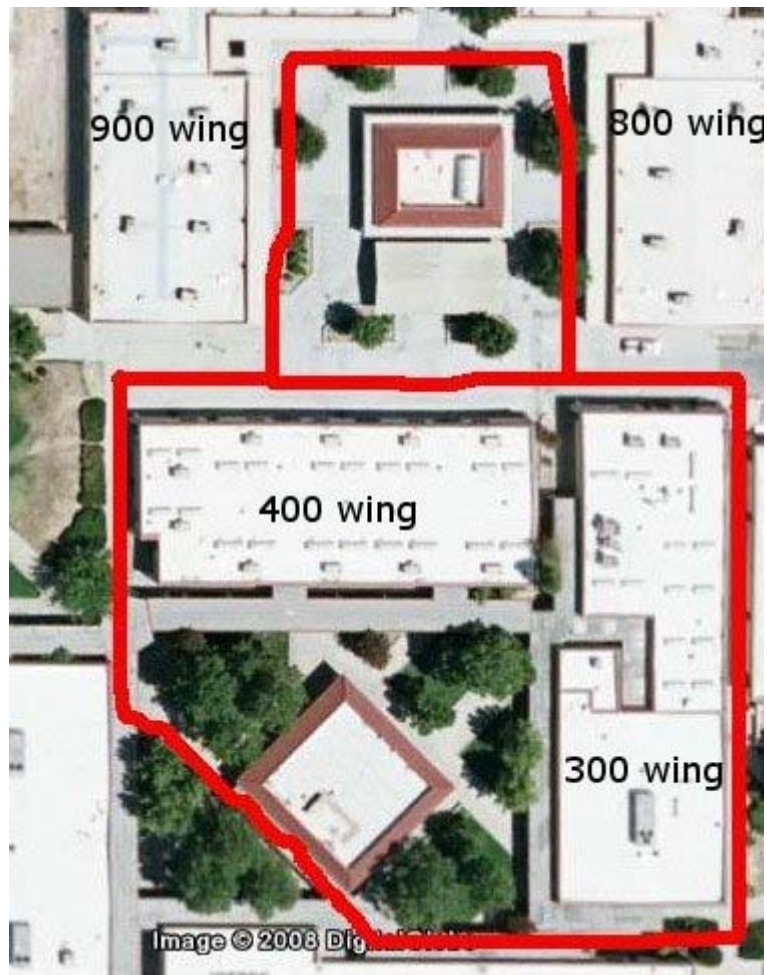
The method in which we performed this experiment was by conducting a field test through campus with the instruments attached to a LabPro and a laptop to monitor the data through a live feed. As shown by the map below, our team conducted three tests three minutes each, each following the basic segments of the outlined map trail.

Specifically, we attached the barometer and the magnetic field sensor together on a PVC pipe; from thereon we walked the trail and the pipe undulated, showing results in the analysis graphs. However, as expected, most of the barometer readings show little or insignificant changes in pressure—or altitude in other words.

Test 1: This test was a little less than three minutes and occurred within the 900/800 wing

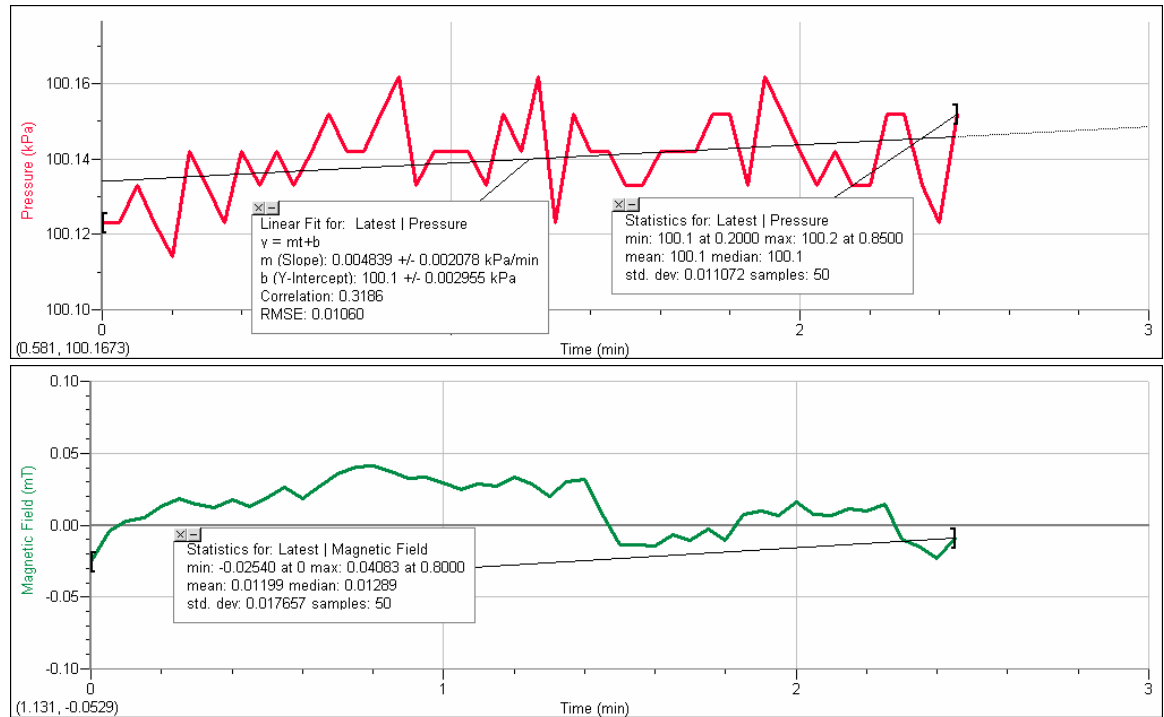
Test 2: This test was three minutes long and began near the top of the 400 wing and ended in the center of the locker/restroom section between the 400 and 300 wing

Test 3: This was three minutes long and began at the end of test two and went all the way back to home base in room 922.



# Analysis:

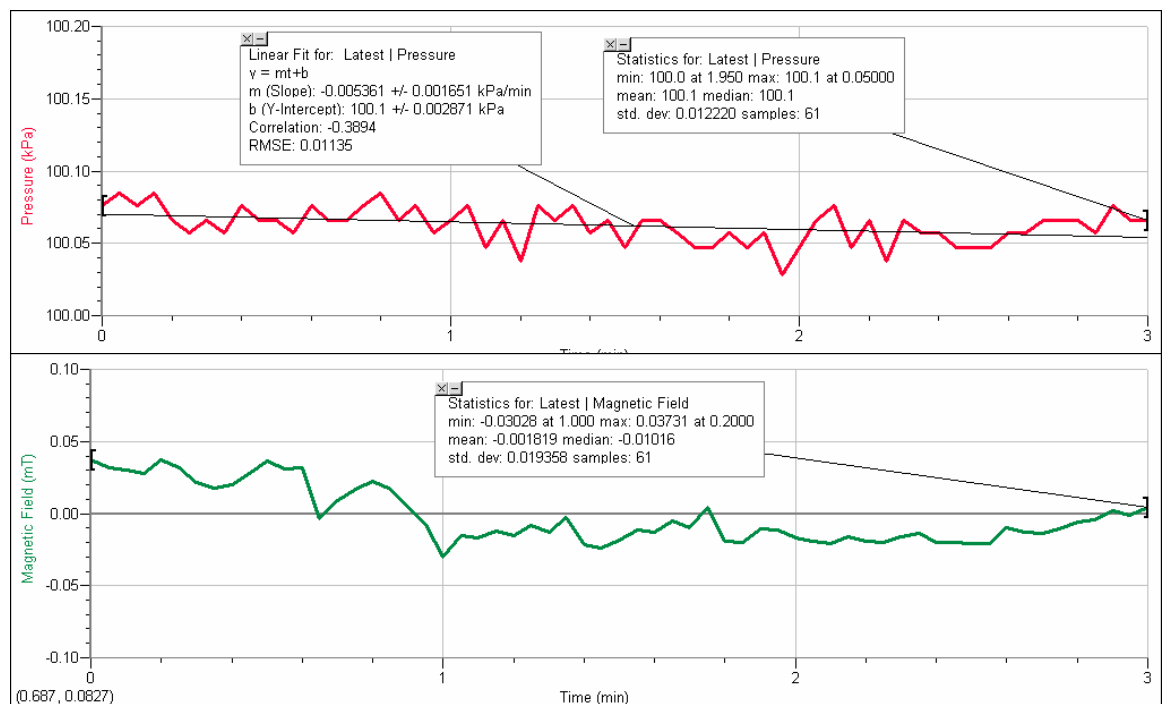
## Test 1:



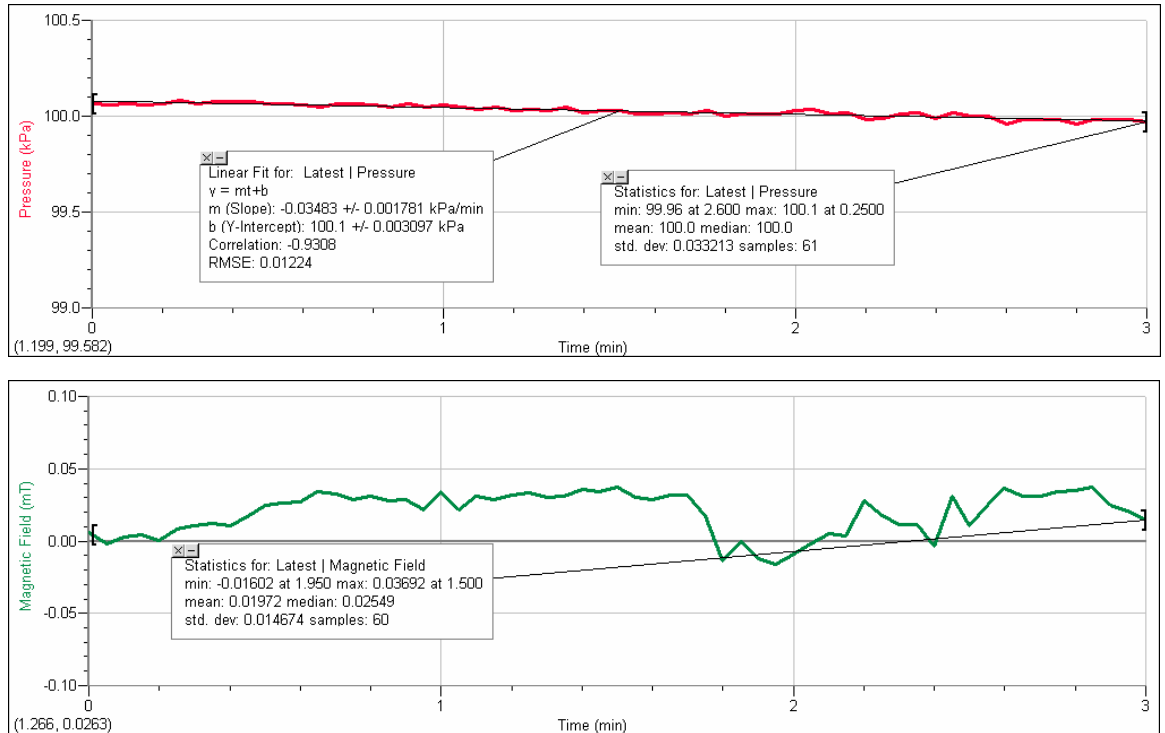
\*A slight error in testing was the sudden cut off in the length of time in the experiment

In the first test the altitude of the sensor array was experience a total change in altitude of about four feet, the field strength changed as a result of the turning of the sensor.

## Test 2:



The results of the second test change for more or less the same reasons that the first test changed, and experienced very similar conditions.  
 Test 3:



The results of the final test can be explained by the fact that the altitude changed minimally, and that the sensor's direction changed nearly constantly.

Resolution of the barometer:  $\pm .0005$  kPa

Resolution of Magnetometer:  $\pm .00005$  mT

For the time being accuracy cannot be determined as we lack an accepted value.

Sources of error:

- Magnetic field sensor received interference from electrical wires from nearby buildings causing spikes in data results
- Magnetic field sensor transitions sporadically between north and south poles, reading spikes in data results
- Oscillating the pole randomly instead of steady upward movements do not properly simulate a balloon rising
- A change in weather conditions can manipulate or ruin barometric pressure readings