

Measure the Earth's Magnetic Field!

1. Connect Magnetic Field Sensor to LabQuest2.
2. Change the duration of the experiment to 40 s.
3. Hold the “wand” vertically. Collect data and watch the graph. Rotate while holding vertically to find maximum and minimum readings.
4. Use statistics – get the mean absolute values of min and max. Find the mean of the two values.
5. Repeat the process with wand held horizontally pointing north or south. And again with wand held horizontally pointing east or west.



File Sensors



CH 1: Magnetic Field

0.0120 mT

Mode:

Time Based

Rate:

20 samples/s

Duration:

40.0 s



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Mode: Time Based

Rate: 20 samples/s

Interval: 0.05 s/sample

Duration: 40 s

Samples to be collected: 801

▷ Triggering: Disabled

▷ Advanced:

▷ Photogate Mode: None

Data Collection

Cancel

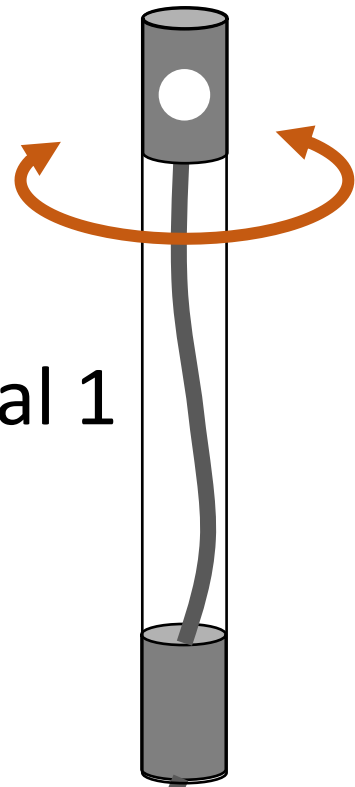
OK



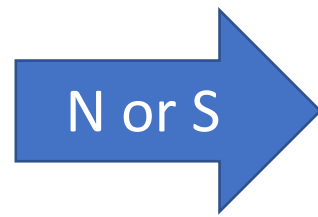
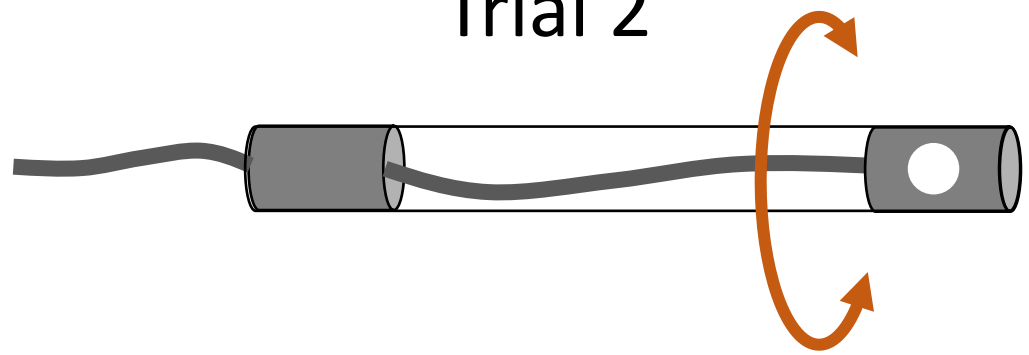
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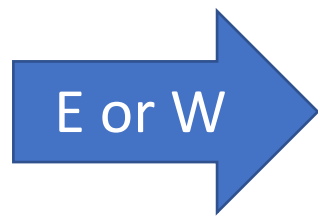
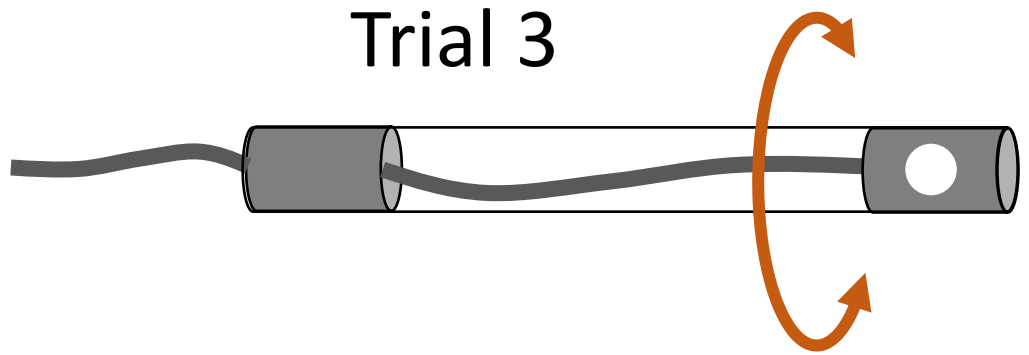
Trial 1



Trial 2

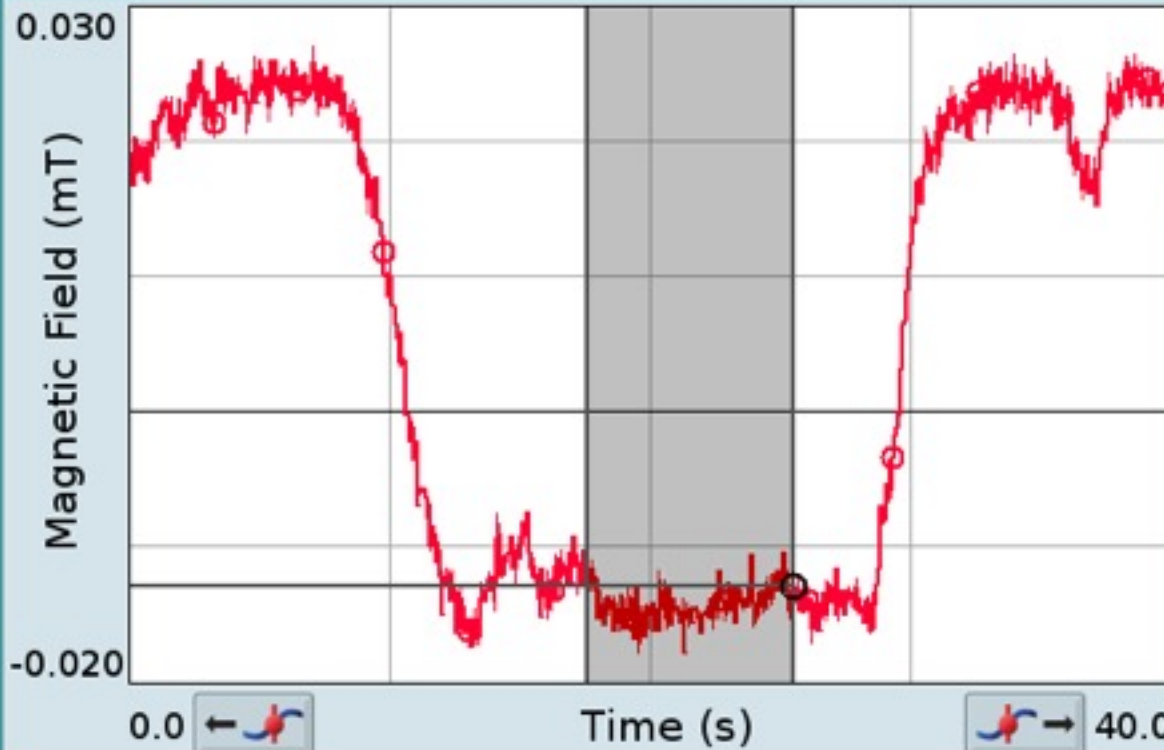


Trial 3





File Graph Analyze



Run 1

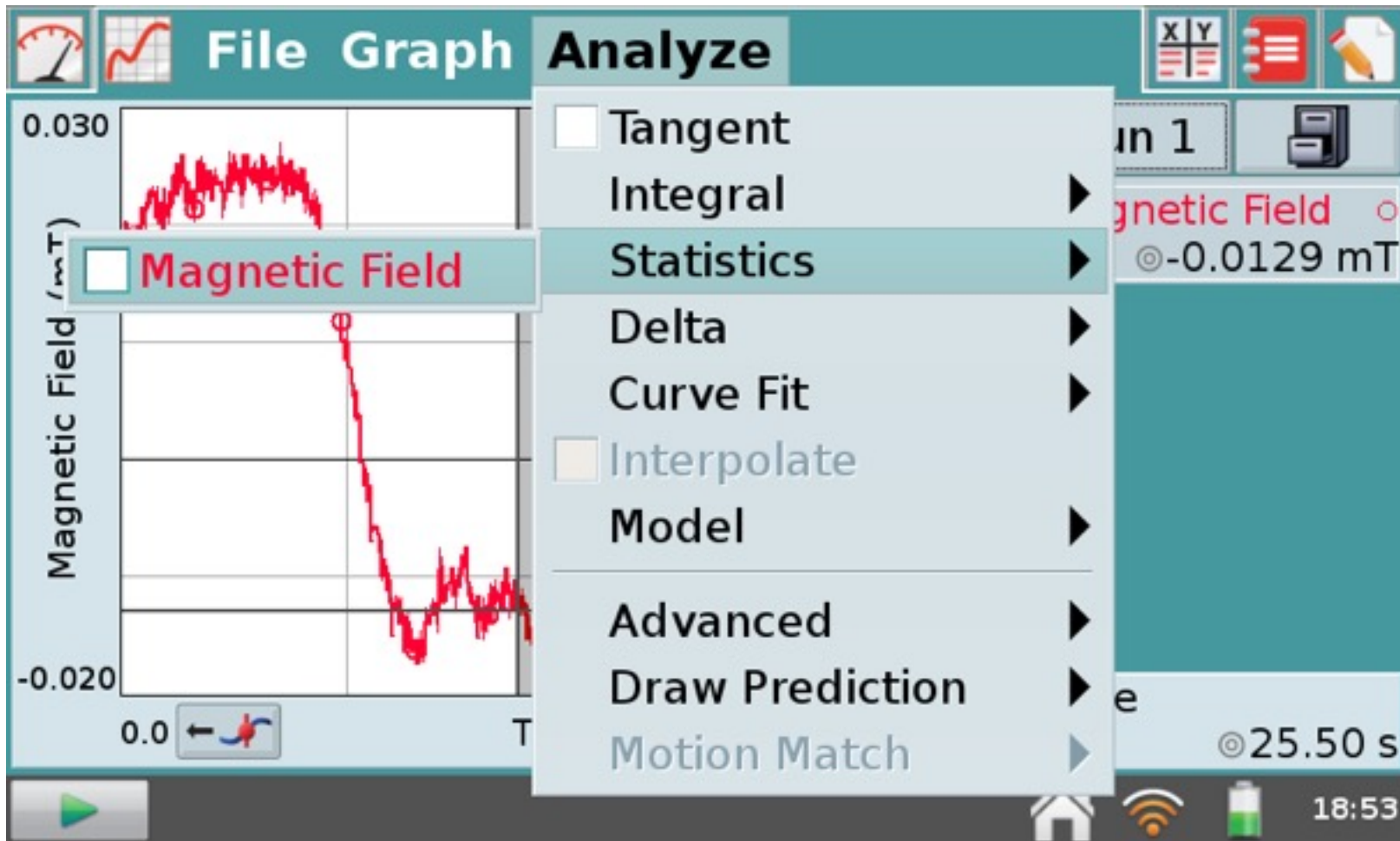


Magnetic Field ○
◎ -0.0129 mT

Time ◎ 25.50 s

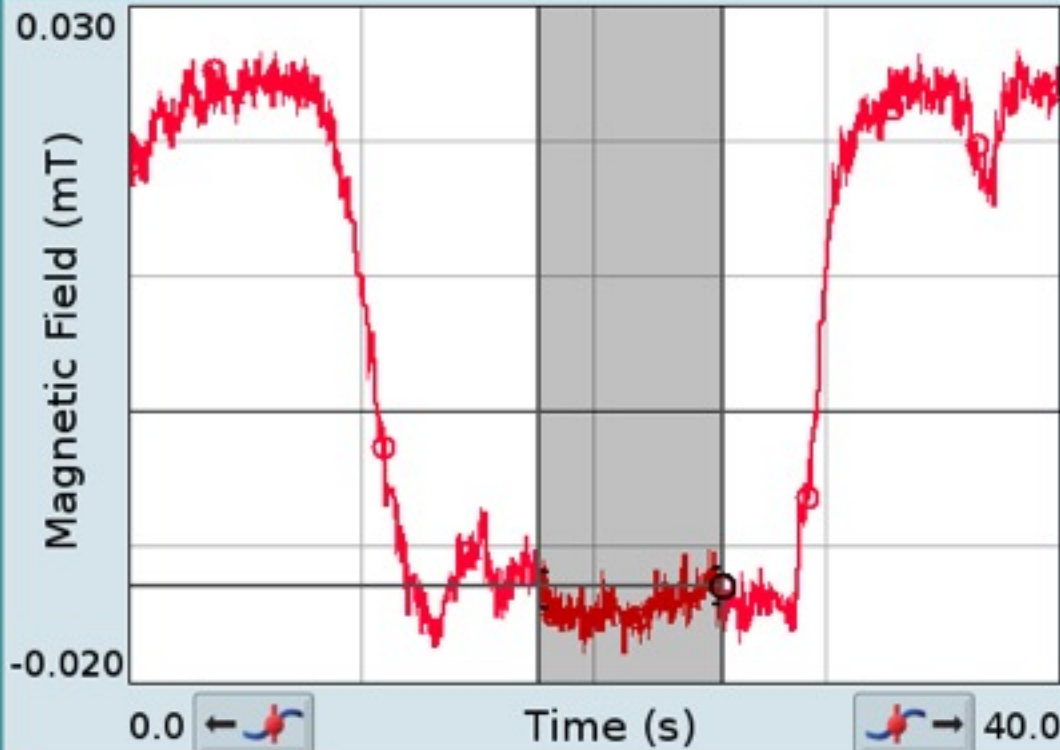


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File Graph Analyze



Run 1



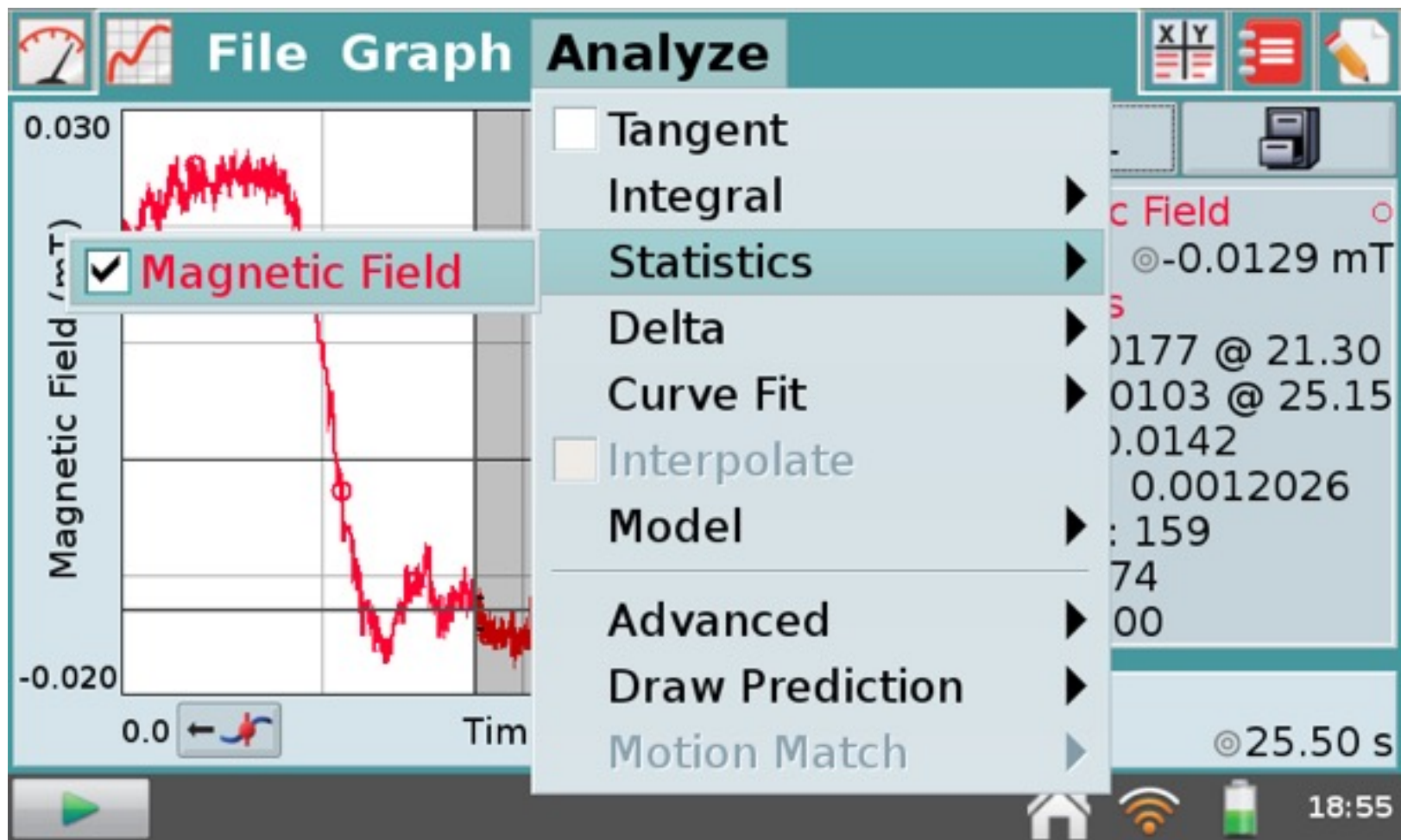
Magnetic Field
⊙ -0.0129 mT

Statistics
min: -0.0177 @ 21.30
max: -0.0103 @ 25.15
mean: -0.0142
std. dev: 0.0012026
samples: 159
 Δy : 0.0074
 Δx : 7.9000

Time
⊙ 25.50 s

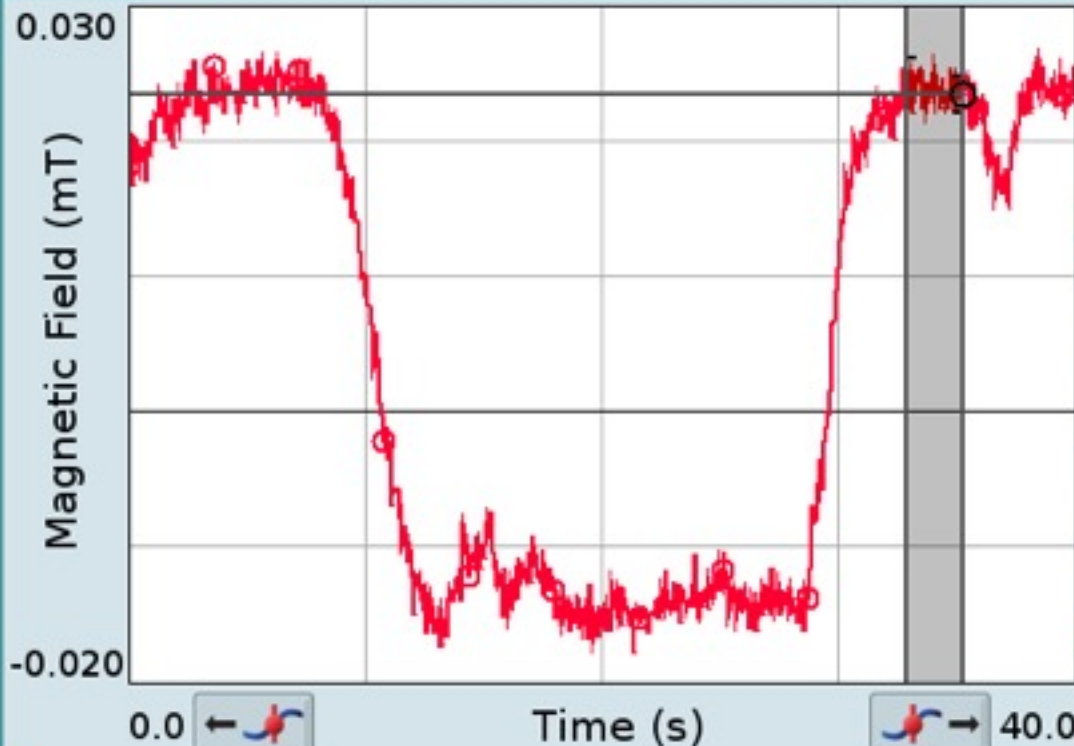


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File Graph Analyze



Run 1



Magnetic Field ○
◎ 0.0234 mT

Statistics

min: 0.0222 @ 33.05
max: 0.0254 @ 33.40
mean: 0.0237
std. dev: 0.00094662
samples: 48
 Δy : 0.0032
 Δx : 2.3500

Time

◎ 35.20 s



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Horizontal Component	Vertical Component	Field Magnitude	Inclination

Based on your measurements, what are your best values for the components and the vector? Do any calculations necessary to answer. Compare to accepted values.

