

Exploration and Environmental Geophysics

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Gravity Survey

We will take a series of gravity measurements to estimate the height of the walkway near the top of the atrium in Howe-Russell. After taking a measurement at a base station, we will take turns taking measurements around the pendulum. At each station, we will record the time, location, temperature, and instrument reading. Periodically we will return to an earlier station to document any instrument drift and/or earth tide effect. We will then return to the base station in Howe-Russell to make a repeat measurement. The instrument readings must be converted to milligals and corrected for instrument drift/Earth Tides. We will not make a latitude correction.

Survey

Station	Location	Time	Temp.	Dial	Gravity	Drift Corrected

Turn in a copy of this data sheet plus 1) an explanation of how you converted dial measurements to mgals; 2) plot of instrument drift/Earth tides correction; 3) estimate of elevation of the walkway using a Free-Air Correction; and 4) a brief (paragraph or two) discussion of potential errors in the survey.

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Laboratory Exercise 1 – Free Air Gravity



Gravity Measurement at Base of Pendulum in
Howe-Russell Complex, LSU



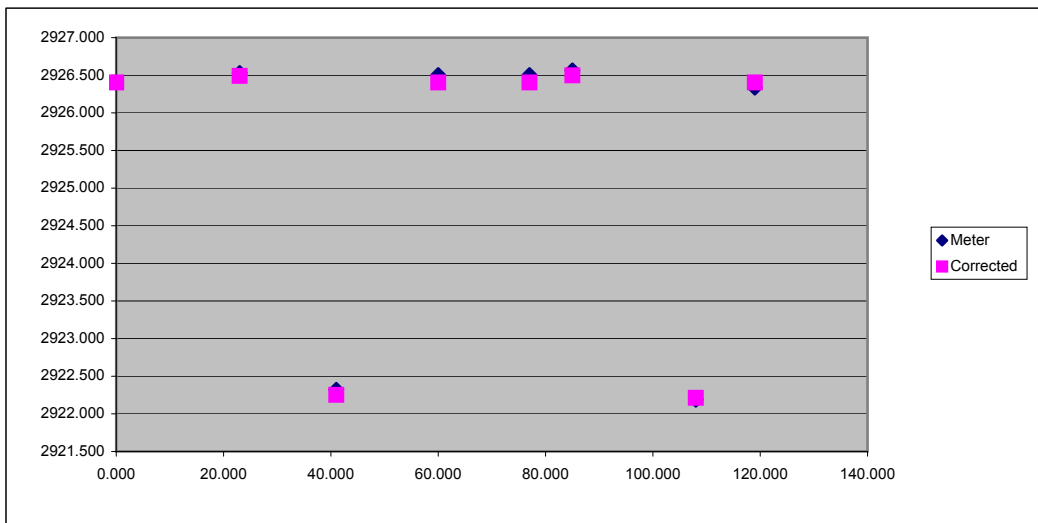
Gravity Measurement at Top of Pendulum in
Howe-Russell Complex, LSU

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Free-Air Gravity Exercise Worksheet

Measurement	Time	Temp., F	Reading	
G1_1	Loading Dock	12:20	48.2	2926.405
G1_2	Base Pend	12:43	48.2	2926.53
G1_3	Top Pend	1:01	48.2	2922.32
G1_4	Loading Dock	1:20	48.2	2926.503
G2_1	Loading Dock	1:37	48.3	2926.715
G2_2	Base Pend	1:45	48.2	2926.565
G2_3	Top Pend	2:08	48.2	2922.187
G2_4	Loading Dock	2:19	48.2	2926.685

Time	Meter	Corrected	mgals
0.000	2926.405	2926.405	3010.641
23.000	2926.530	2926.492	3010.731
41.000	2922.320	2922.253	3006.367
60.000	2926.503	2926.405	3010.641
77.000	2926.503	2926.405	3010.641
85.000	2926.565	2926.499	3010.738
108.000	2922.187	2922.213	3006.326
119.000	2926.335	2926.405	3010.641



Time	Meter	Gradients	Corrected
0	2926.405		2926.405
23	2926.53		2926.492
41	2922.32		2922.253
60	2926.503	0.002	2926.405
77	2926.503	0.098	2926.405
85	2926.565		2926.499
108	2922.187		2922.213
119	2926.335	-0.004	2926.405

	Measured del_g	Estimated meters	Height feet
3010.731			
3006.367	4.239	13.74	45.06
3010.738			
3006.326	4.286	13.89	45.55
	Inferred del_g	Observed Meters	Height feet
	4.563	14.79	48.5