Experiment 2: Springs and Oscillations Part 2C – Damped Harmonic Motion

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| --- | --- | --- |
| Name | Partner | Date |
| Spring ID Number:A | Spring constant, from last week $(k)$: |
| Measurements for characterizing mass hangers

|  |  |  |
| --- | --- | --- |
| Disk | Mass | Radius |
|  |  |  |
|  |  |  |
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|  |  |  |
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  | Rough sketch of position vs time for oscillating mass  |
| Fit parameters for underdamped oscillator model

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| --- | --- | --- | --- | --- | --- |
| Disk | $$y\_{0}$$ | $$A$$ | $$γ$$ | $$ω$$ | $$ϕ$$ |
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| Damping coefficient dependence on disk size

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| --- | --- | --- | --- |
| Disk | $$b$$ | $$r$$ | $$Area$$ |
|  |  |  |  |
|  |  |  |  |
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|  |  |  |  |
|  |  |  |  |

Describe, using your graph results, specifically how the damping coefficient depends on the disk size. |

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| Describe (in general terms) how the angular frequency $ω$ varies (or doesn’t) with the amount of damping. |
| Describe whether your simulation displays the same behavior for different size disks that you have observed experimentally. |
| Attachments:* Annotated graphs showing measured position vs time for damped oscillator, with best fit.
* Annotated graph showing simulated position vs time for damped oscillator.
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