

Commissioning Day 2: Amplitude Detuning

Joschua Dilly and the OMC-Team

Many Kicks!

with increasing amplitude in the plane of interest:

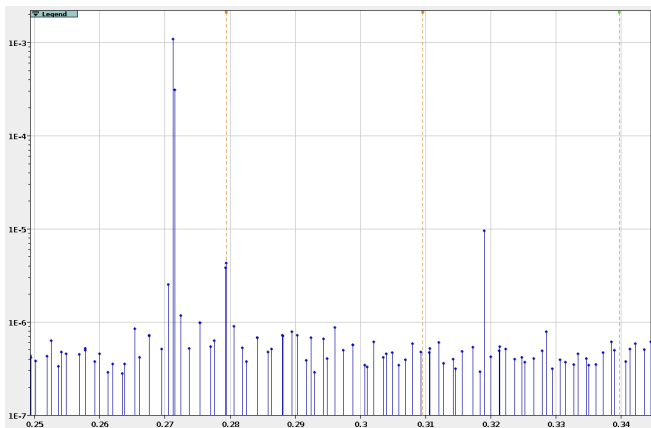
DOING H DETUNING

HORIZONTAL 2.0% Tune:0.2793 Delta:-0.008 VERTICAL 1.5% Tune:0.309 Delta:0.01
HORIZONTAL 3.0% Tune:0.2793 Delta:-0.008 VERTICAL 1.5% Tune:0.309 Delta:0.01
HORIZONTAL 4.0% Tune:0.2793 Delta:-0.008 VERTICAL 1.5% Tune:0.309 Delta:0.01
HORIZONTAL 5.0% Tune:0.2793 Delta:-0.008 VERTICAL 1.5% Tune:0.309 Delta:0.01
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HORIZONTAL 8.0% Tune:0.2793 Delta:-0.008 VERTICAL 1.5% Tune:0.309 Delta:0.01
HORIZONTAL 10.0% Tune:0.2793 Delta:-0.008 VERTICAL 1.5% Tune:0.309 Delta:0.01
HORIZONTAL 12.0% Tune:0.2793 Delta:-0.008 VERTICAL 1.5% Tune:0.309 Delta:0.01
HORIZONTAL 14.0% Tune:0.2793 Delta:-0.008 VERTICAL 1.5% Tune:0.309 Delta:0.01
HORIZONTAL 15.0% Tune:0.2793 Delta:-0.008 VERTICAL 1.5% Tune:0.309 Delta:0.01
HORIZONTAL 16.0% Tune:0.2793 Delta:-0.008 VERTICAL 2.0% Tune:0.309 Delta:0.01
HORIZONTAL 18.0% Tune:0.2793 Delta:-0.008 VERTICAL 2.0% Tune:0.309 Delta:0.01
HORIZONTAL 19.0% Tune:0.2793 Delta:-0.008 VERTICAL 2.0% Tune:0.309 Delta:0.01

Then:

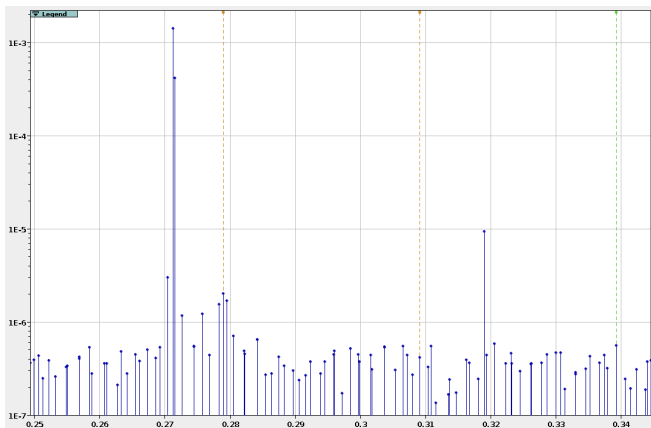
- Clean Data and analyze spectrum \Rightarrow Make sure natural tune is found
- Run optics Analysis (to get the action)
- Fit tune-shift vs. action

Frequency Chart



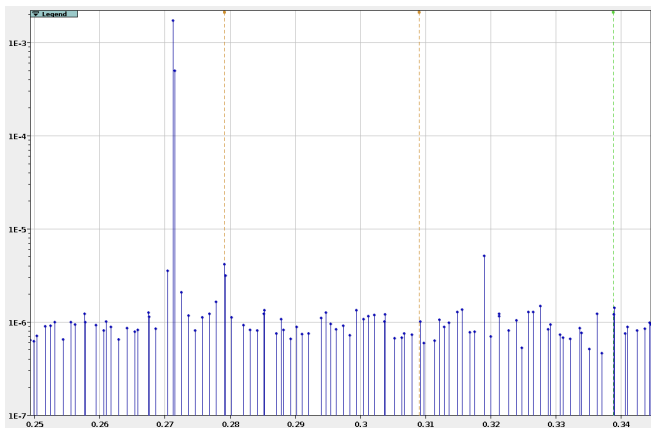
- Natural Tune clearly visible in spectrum
 - Easy to keep track of between measurements
 - $4Q_y$ line visible ($Q_x \pm 4Q_y$ i.e. f_{1004} or f_{1040} resonance)

Frequency Chart



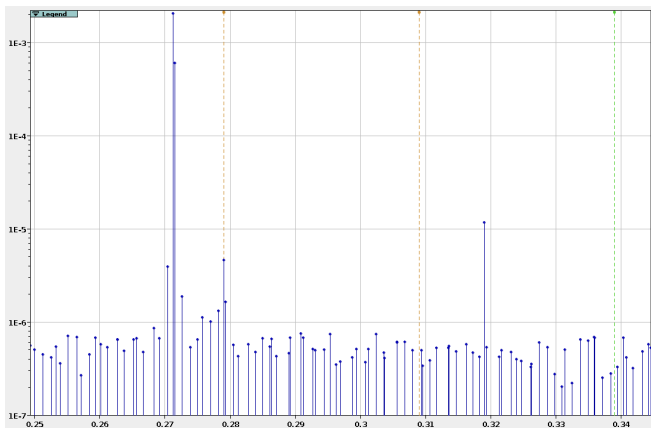
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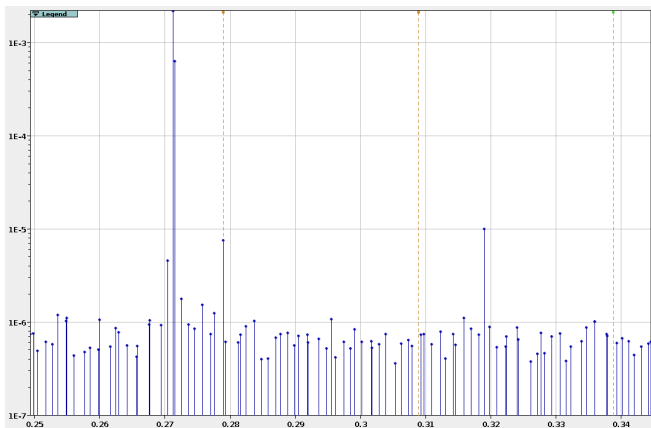
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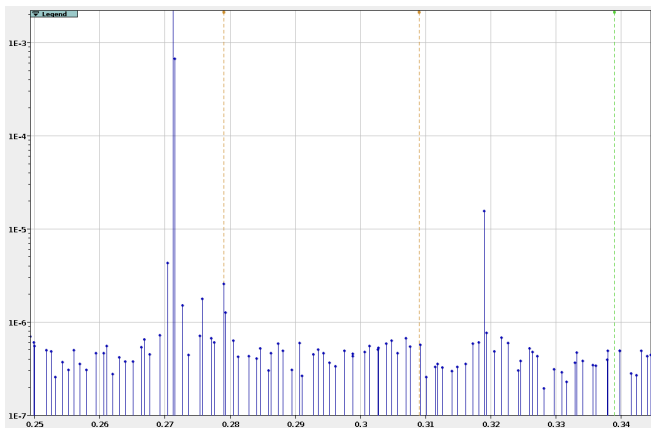
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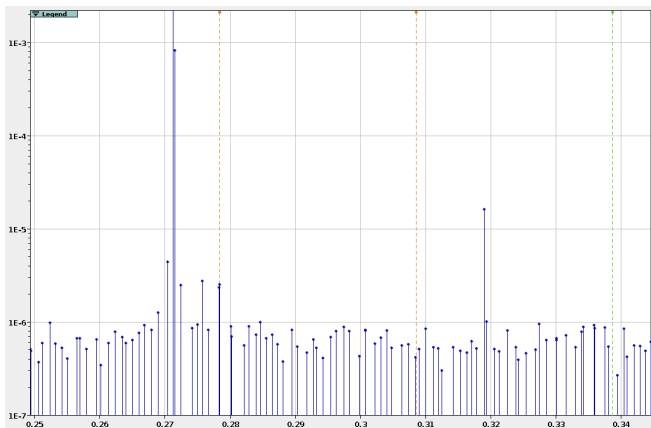
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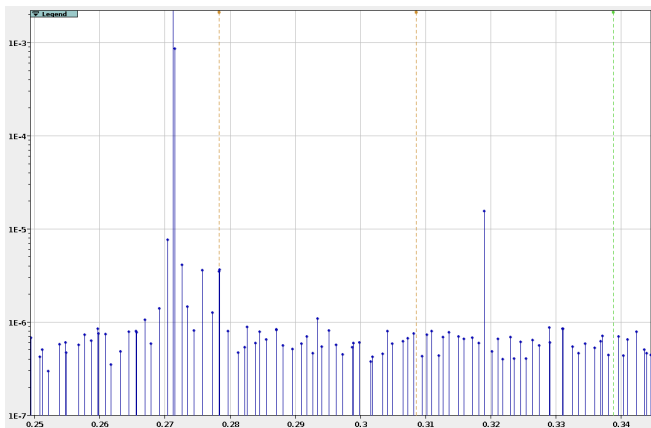
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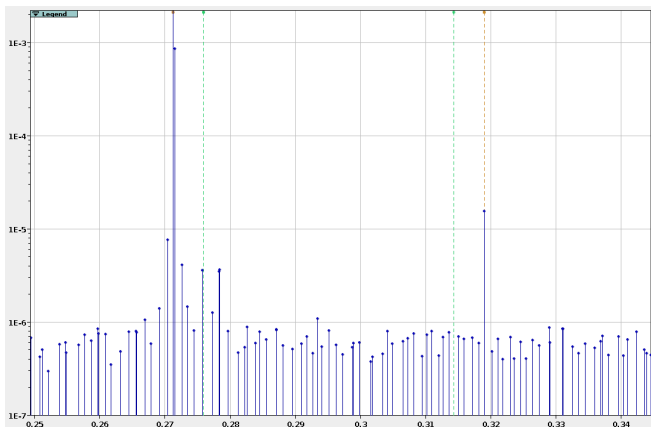
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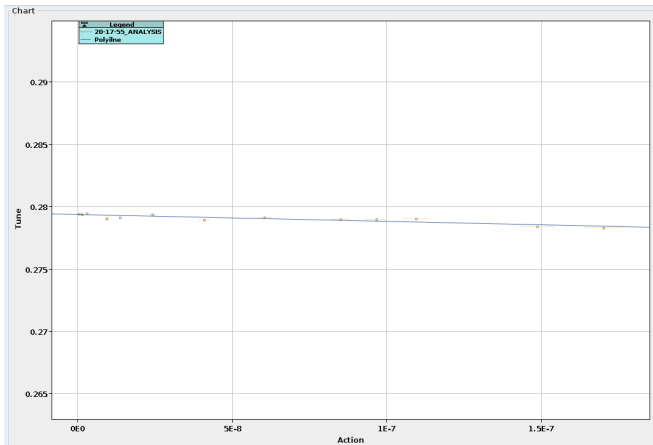
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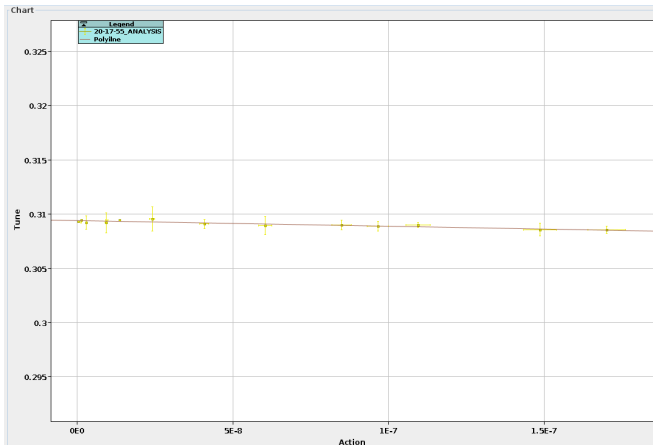
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Amplitude Detuning



- Horizontal Kicks Analysis:
 - $\partial Q_x / \partial (2J_x) = -5.5 \times 10^3 \text{ m}^{-1}$ ($-2.75 \times 10^3 \text{ m}^{-1}$ because ACD)
 - $\partial Q_y / \partial (2J_x) = -5.2 \times 10^3 \text{ m}^{-1}$
- ⇒ Comparable to earlier measurements

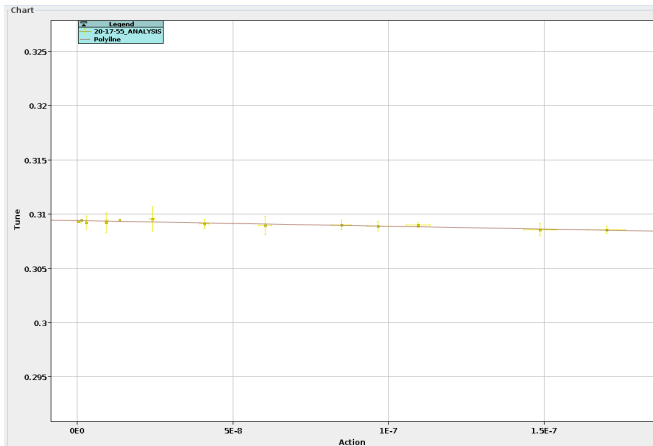
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