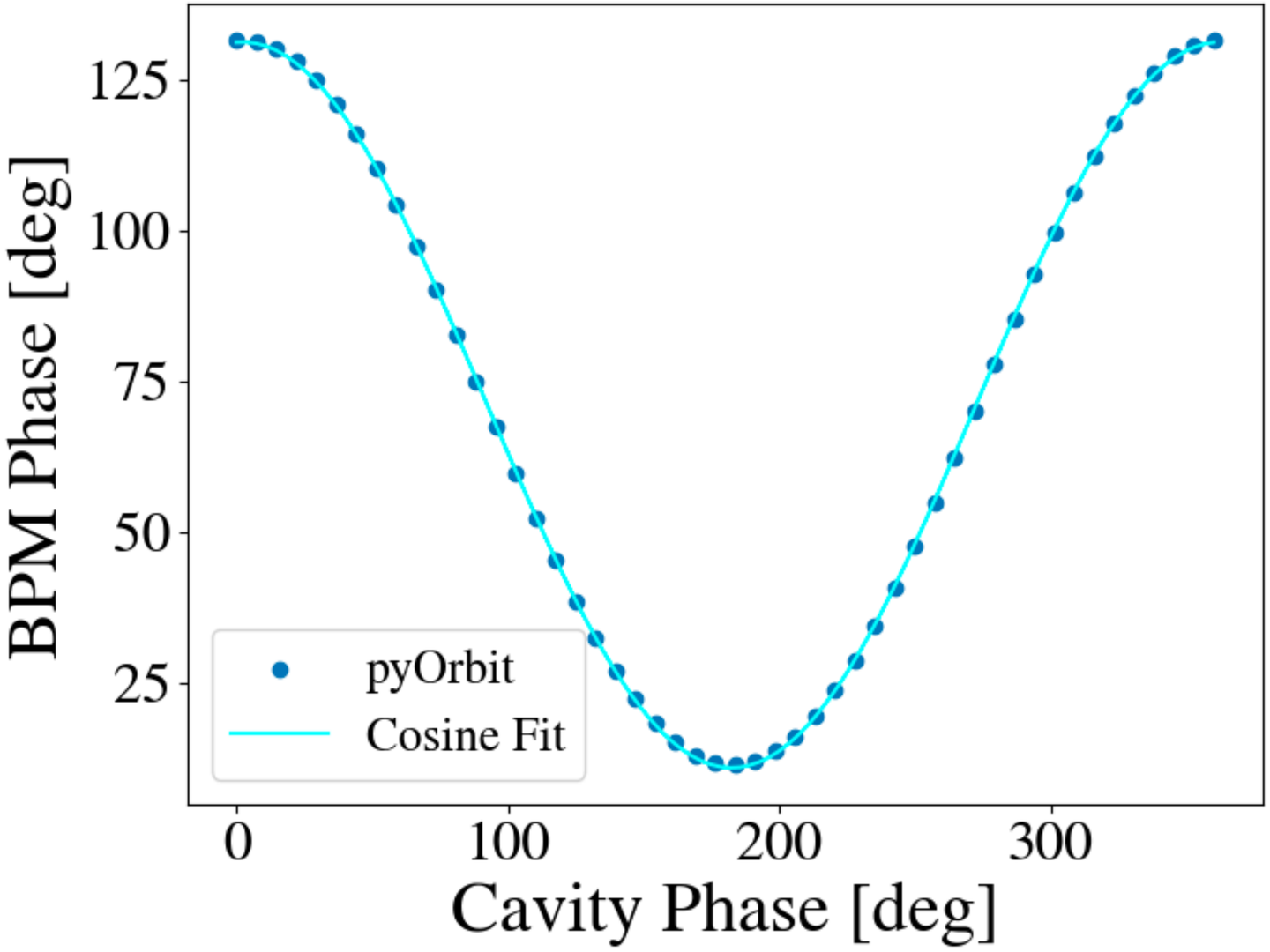
Wednesday's Homework

Control Room Accelerator Physics
USPAS Winter 2024

Cosine Fit to RF Scan



Amplitude = 60.17342365 [deg]

Phase Offset = -2.41290335 [deg]

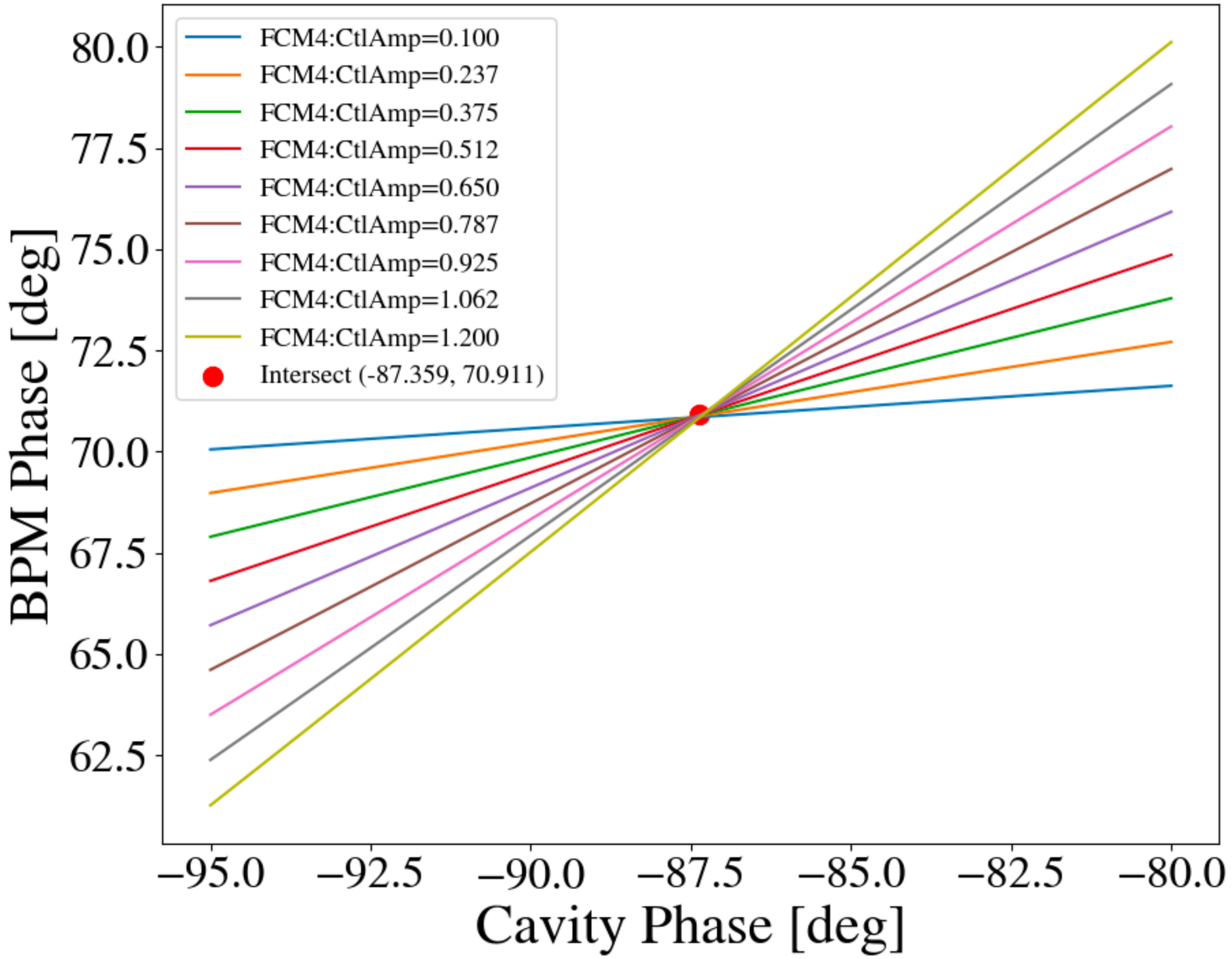
Average Value = 71.10878278 [deg]

qVeff Equation for Sine amplitude

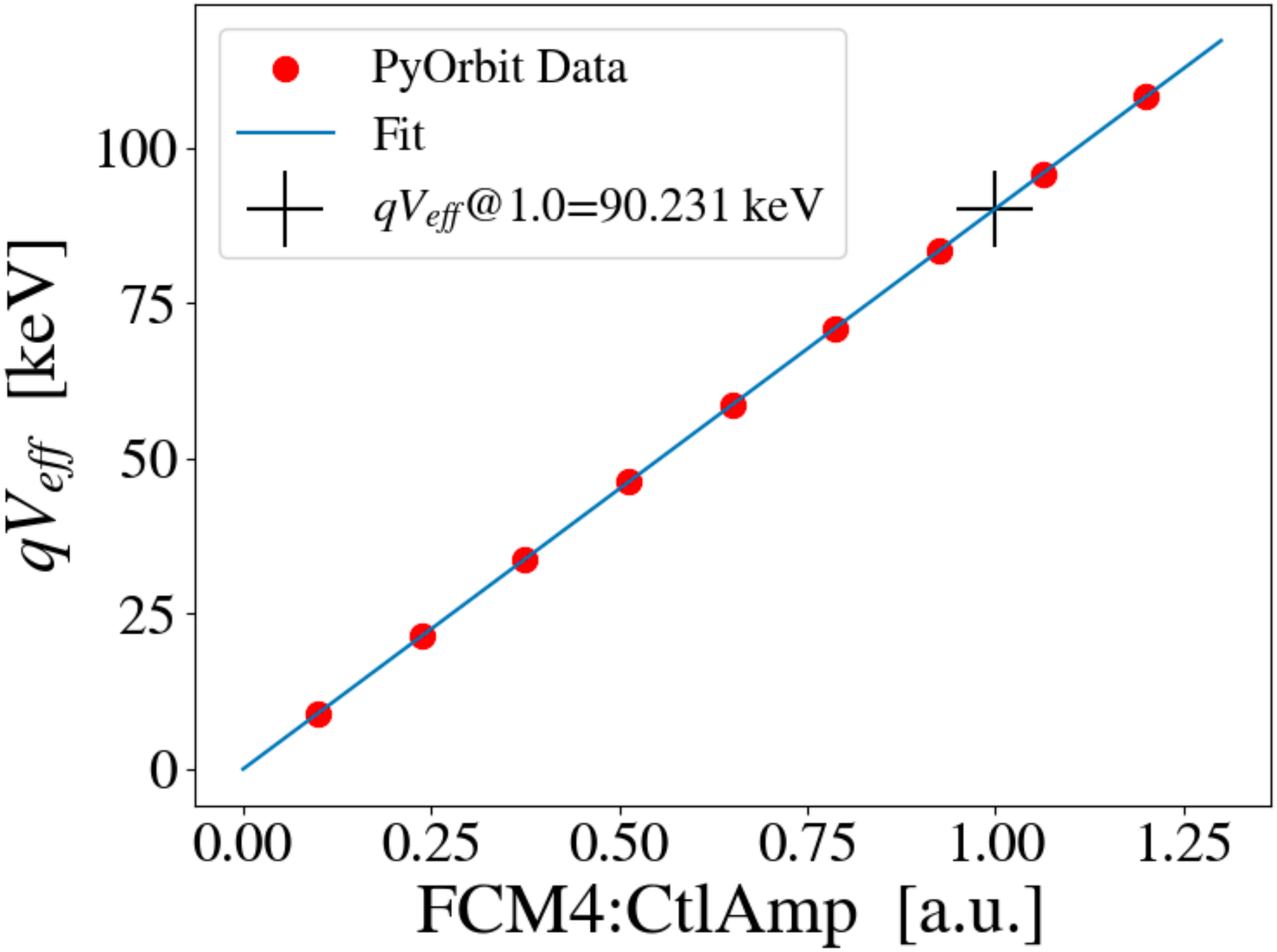
$$\varphi_{BPM} = \frac{2\pi f_{BPM} s}{c\beta_0} + \frac{2\pi f_{BPM} s \; qV_{eff}}{mc^2 c\beta_0^3} \cos\phi_{RF}$$

$$qV_{eff} = 90.291 \; [keV]$$

Crossing lines derivatives

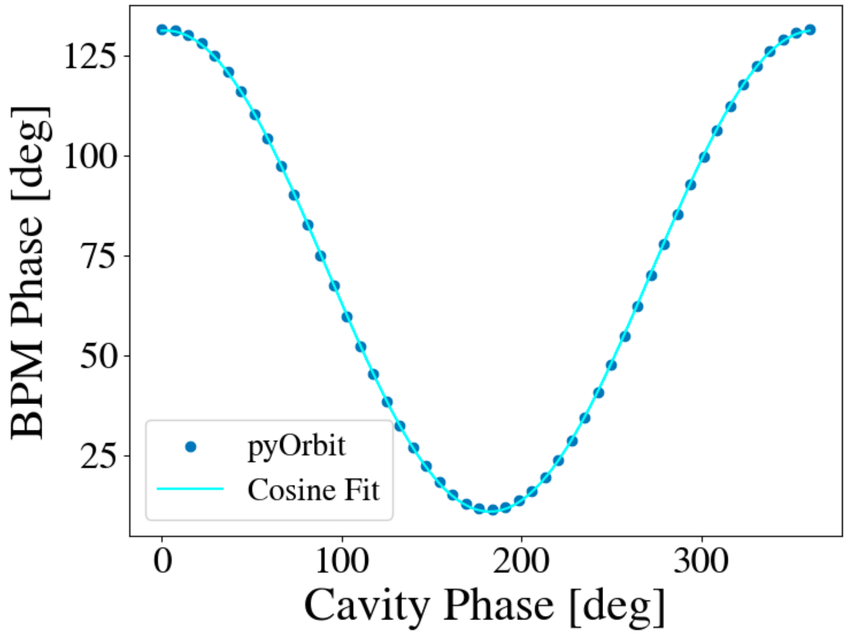


qVeff for Amplitude=1.0

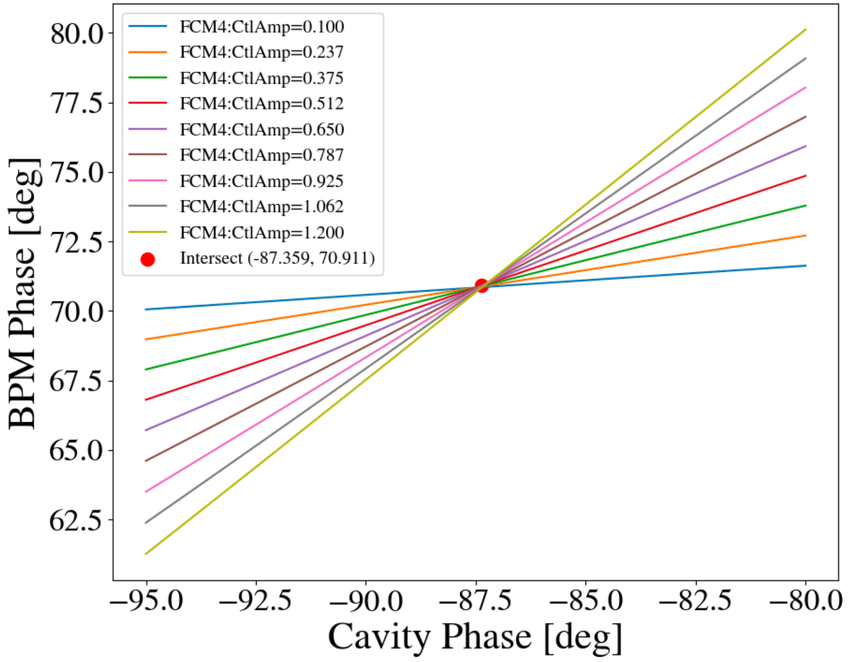


$$qV_{eff} = 90.231\ [keV]$$

Comparison



$$qV_{eff} = 90.291\ [keV]$$



$$qV_{eff} = 90.231\ [keV]$$