PHYS639, Spring16, Problem 3, Addendum

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For parameter values $q = 0.5$, $\Omega_D = 2/3$, $F_D = 0.5$ the dynamics of the pendulum is regular. If you increase the force to $F_D = 1.2$ though it becomes chaotic. For both of these cases and various initial conditions

1. Make *Phase space plots* ω vs θ.
2. Plot *Poincaré sections* for $t \approx 2\pi n/\Omega_D$ and $t \approx 2\pi n/\Omega_D + \pi/4$.

Bonus Problems

1. Investigate how the *strange attractor* is affected by small changes in pendulum parameters, by plotting the Poincaré sections for slightly different driving force and drive frequency.
2. Zoom into the strange attractor by making a high resolution plot for the region $\theta > 2$. You should be able to notice the fractal structure of the strange attractor.