# B13 (Individual)
## MatLab Plots of Steering versus Pitch Angle
## Due February 18, 2010

There are three equations for the pitch angle of the frame, $\mu$, given in your text. You will use these to produce the following series of 6 plots.

1) Use the equation for $\mu$ on page 15 to plot a nice picture.

   Do this by developing a MatLab .m file which does the plotting for you. It should have nice input so that it can be used on any bike quite easily. On the vertical axis should be the pitch angle, $\mu$, in degrees. On the horizontal axis should be the steering angle, $\delta$, in degrees.

   Let $p = 1.40m, a_n = 0.10m, \varepsilon = 30°, R_r = R_f = 0.36m, t_r = t_f = 0.06m$ for all of your curves.

   Your plot will consist of a set of curves, one curve for each of the following values for $\varphi$. $\varphi = 0°, 15°, 30°, 45°$.

2) Use the equation for $\mu$ on page 15 to plot a nice picture.

   Do this by developing a MatLab .m file which does the plotting for you. It should have nice input so that it can be used on any bike quite easily. On the vertical axis should be the pitch angle, $\mu$, in degrees. On the horizontal axis should be the steering angle, $\delta$, in degrees.

   Use the parameters of your bicycle.

   Your plot will consist of a set of curves, one curve for each of the following values for $\varphi$. $\varphi = 0°, 15°, 30°, 45°$.

3) Use the equation for $\mu$ in the middle of page 16 to plot a nice picture.

   Do this by developing a MatLab .m file which does the plotting for you. On the vertical axis should be the pitch angle, $\mu$, in degrees. On the horizontal axis should be the steering angle, $\delta$, in degrees.

   Let $p = 1.40m, a_n = 0.10m, \varepsilon = 30°, R_r = R_f = 0.36m, t_r = t_f = 0.06m$ for all of your curves.

   Your plot will consist of a set of curves, one curve for each of the following values for $\varphi$. $\varphi = 0°, 15°, 30°, 45°$.

4) Use the equation for $\mu$ in the middle of page 16 to plot a nice picture.

Do this by developing a MatLab .m file which does the plotting for you. On the vertical axis should be the pitch angle, $\mu$, in degrees. On the horizontal axis should be the steering angle, $\delta$, in degrees.

Use your bicycle's parameters.

Your plot will consist of a set of curves, one curve for each of the following values for $\varphi$. $\varphi = 0°, 15°, 30°, 45°$.

5) Use the equation for $\mu$ at the bottom of page 16 to plot a nice picture.

Do this by developing a MatLab .m file which does the plotting for you. On the vertical axis should be the pitch angle, $\mu$, in degrees. On the horizontal axis should be the steering angle, $\delta$, in degrees.

Let $p = 1.40m, a_n = 0.10m, \varepsilon = 30°, R_r = R_f = 0.36m, t_r = t_f = 0.06m$ for all of your curves.

Your plot will consist of a set of curves, one curve for each of the following values for $\varphi$. $\varphi = 0°, 15°, 30°, 45°$.

6) Use the equation for $\mu$ at the bottom of page 16 to plot a nice picture.

Do this by developing a MatLab .m file which does the plotting for you. On the vertical axis should be the pitch angle, $\mu$, in degrees. On the horizontal axis should be the steering angle, $\delta$, in degrees.

Use your bicycle's parameters.

Your plot will consist of a set of curves, one curve for each of the following values for $\varphi$. $\varphi = 0°, 15°, 30°, 45°$.

Compare and contrast plots 1), 3), and 5) and 2),4), and 6).

Send me the .m files, one for each plot, which created your figures. Include your plots in your LaTeX write up. Your comparison should be submitted electronically as a .pdf file.