Homework, due October 21, 2019

Storage ring design problem set #2

(1) Use the missing bend scheme to make the periodic dispersion and its slope zero on two sides of the ring that you designed in storage ring design problem set #1. How many quadrupole strengths did you need to change?

(2) Design two low beta insertions into the regions where the dispersion is now zero. Adjust the beta function in the center to have a waist, i.e. alpha=0 with beta=0.5m in the horizontal and vertical. How many quadrupoles did you need to adjust in the low beta insertion to fulfill all requirements.

(3) Change all quadrupoles in the FoDo cells to have the tune not close to an integer or half an integer. Then rematch the dispersion suppression and low beta insertion to have them work properly, i.e. match the periodic dispersion of the FoDo to zero and the periodic beta functions of the FoDo cells to the waist value.