Open Optical Networks - Control Plan

Exercise 1 - Power Sweep

1. download from the web portal the following files:
   - eqpt.json
   - default_edfa_config.json
   - utilities.py
2. create a json file with the parameters of your Fiber. This json file has the following parameters:
   - "uid": a string used as unique identifier. You can use the name you want.
   - "params": a structure containing the following parameters:
     - "length": 80 km (length of the fiber)
     - "loss_coef": 0.2 dB/km (attenuation coefficient)
     - "length_units": "km" (this parameter automatically scales the length and the loss coefficient)
     - "att_in": 0 dB (attenuation before the fiber)
     - "con_in": 0 dB (loss of the connector at the input of the fiber)
     - "con_out": 0 dB (loss of the connector at the output of the fiber)
     - "type_variety": "SSMF"
     - "dispersion": 1.67e-05 s/m^2 (dispersion coefficient)
     - 'gamma': 0.00127 W/m (non-linear coefficient)
3. Instantiate the amplifier, as in Exercise 1.4 Lesson 4, in such a way it recovers the loss.
4. Instantiate the fiber from the JSON file.
5. Build a line composed of 10 span (fiber - amplifier). The line has to be a vector of tuples, each containing a fiber and an amplifier with the configuration of Exercise 1.
6. Instantiate the spectral information according to eqpt.json file.
7. Perform a power sweep varying the power per channel of the spectral information between -5 and +2 dBm with steps of 0.25 dBm.
8. Propagate the spectral information through the all line elements.
9. Plot in the spame figure OSNR, SNR_{NL} and GSNR for the channel in the middle of the comb at the end of the line.

Exercise 2 - LOGO

1. Compute the optimum transmitted power according to the LOGO algorithm.
2. Propagate the spectral information through the line of the previous exercise using the optimum transmitted power.
3. Plot the obtained GSNR at the end of the line for the middle channel in the spame plot of exercise 1 (plot a single point using a marker).

Exercise 3 - Comparison

1. Modify the fiber json such as the loss coefficient is 0.3 dB/km.
2. Repeate exercise 1 and 2 on this line and compare the two systems.