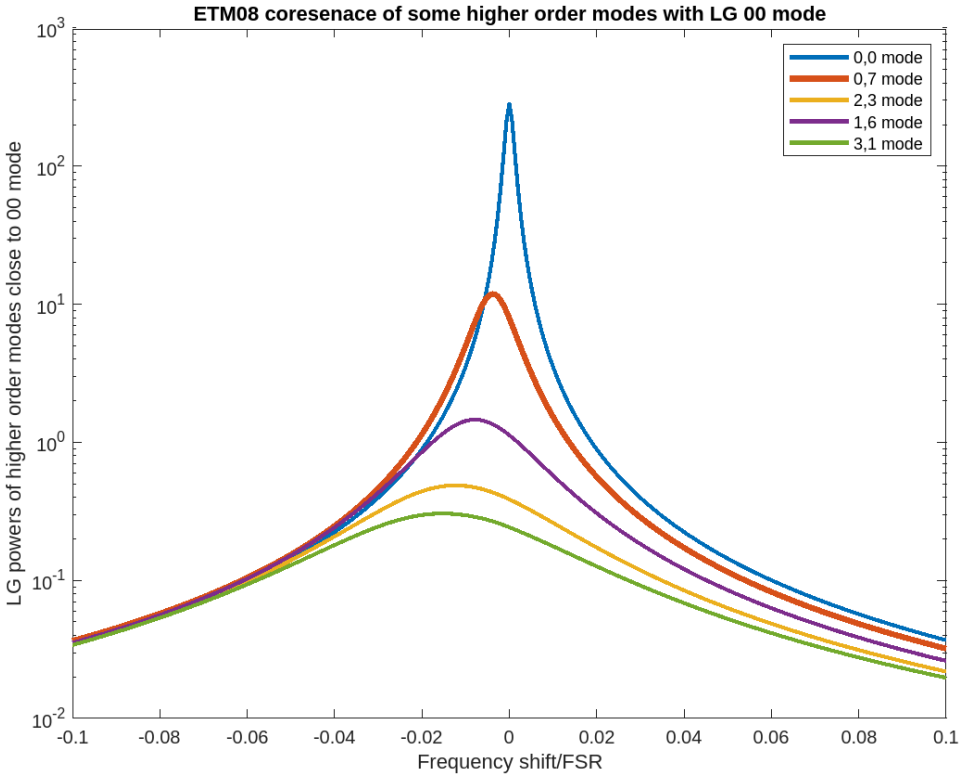
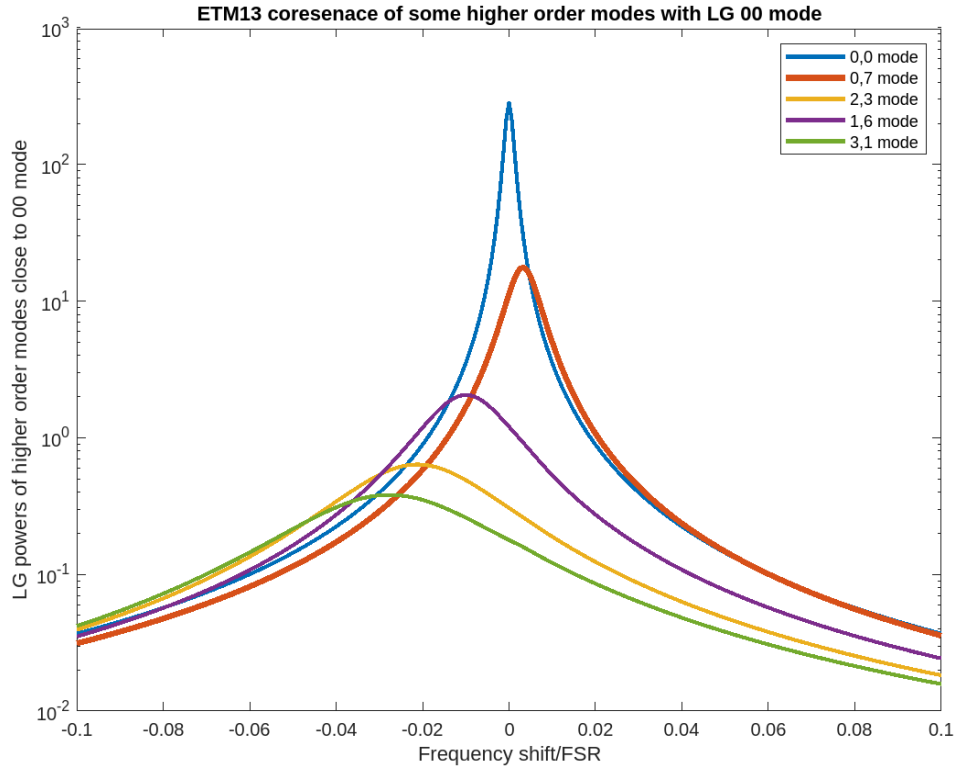
Graphing for three pairs of ITM and ETM (representing mirrors used for O4 and O5) but with LG:

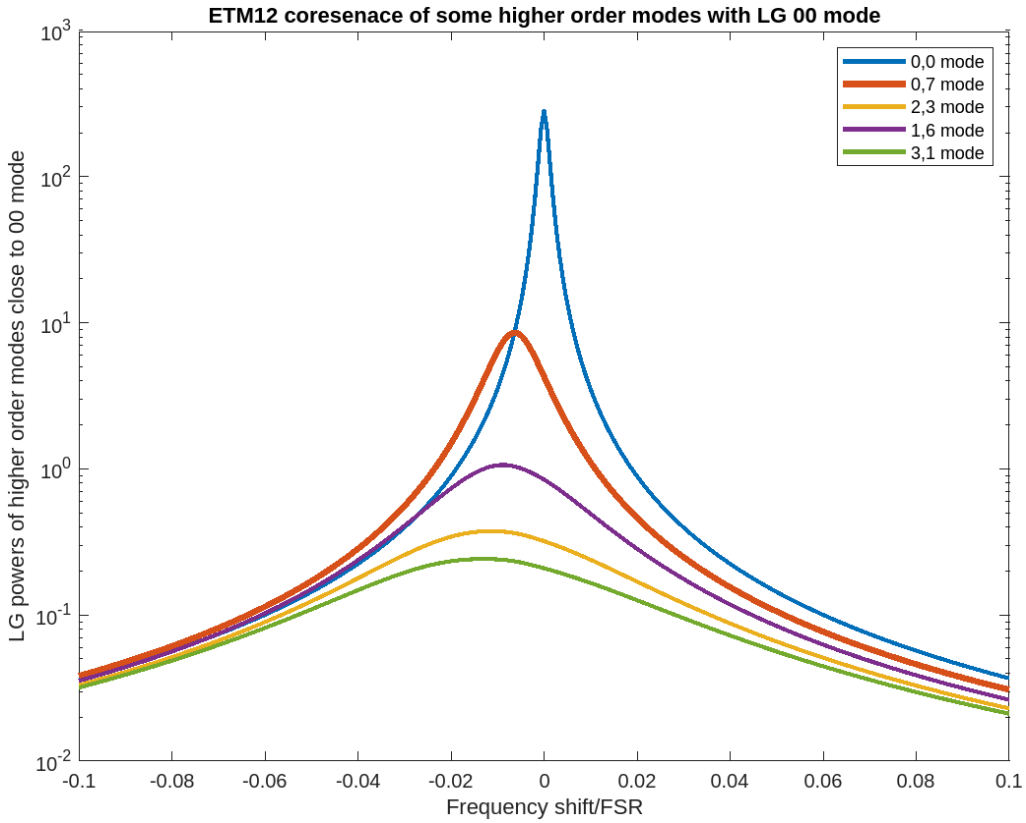
ITM04 and ETM08:



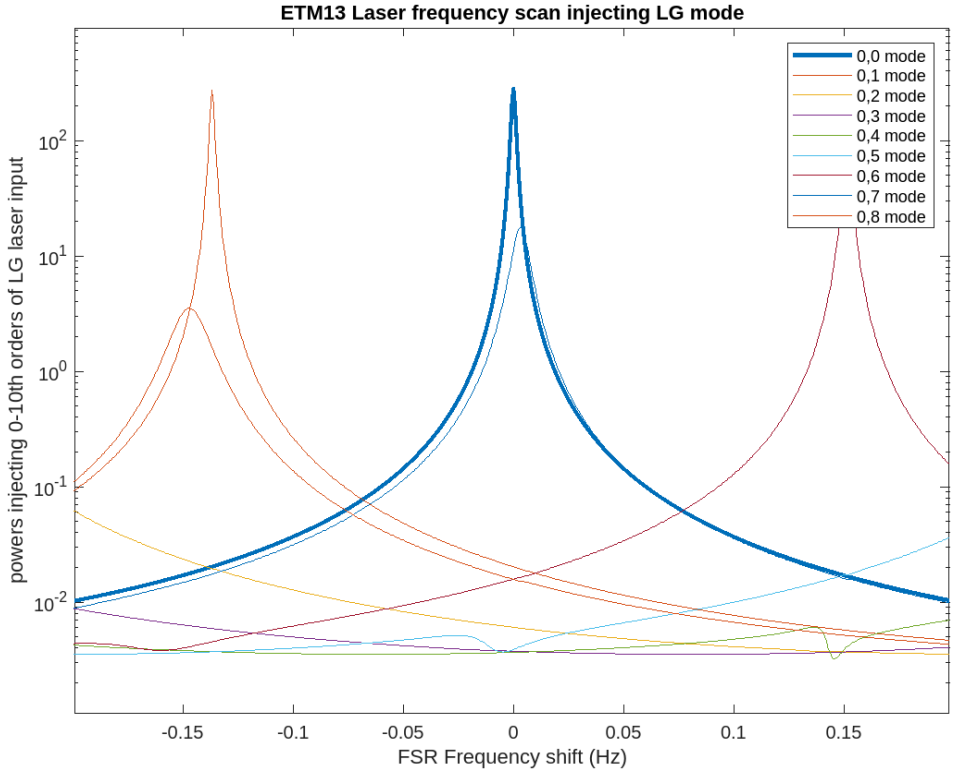
ITM07 and ETM13:

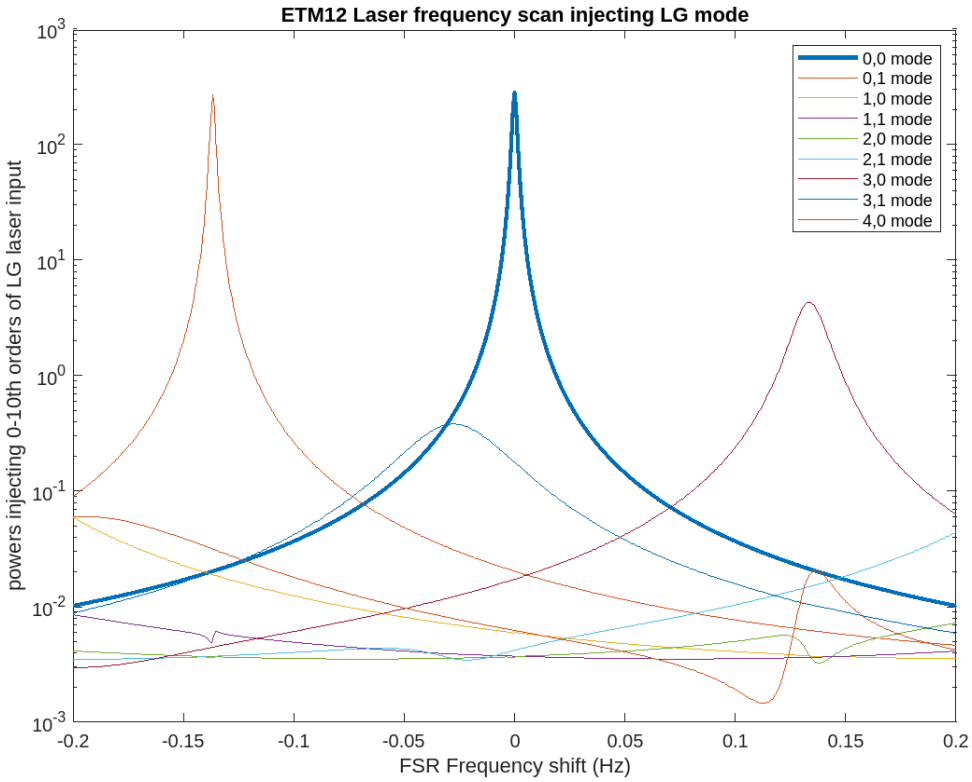


ITM08 and ETM12:

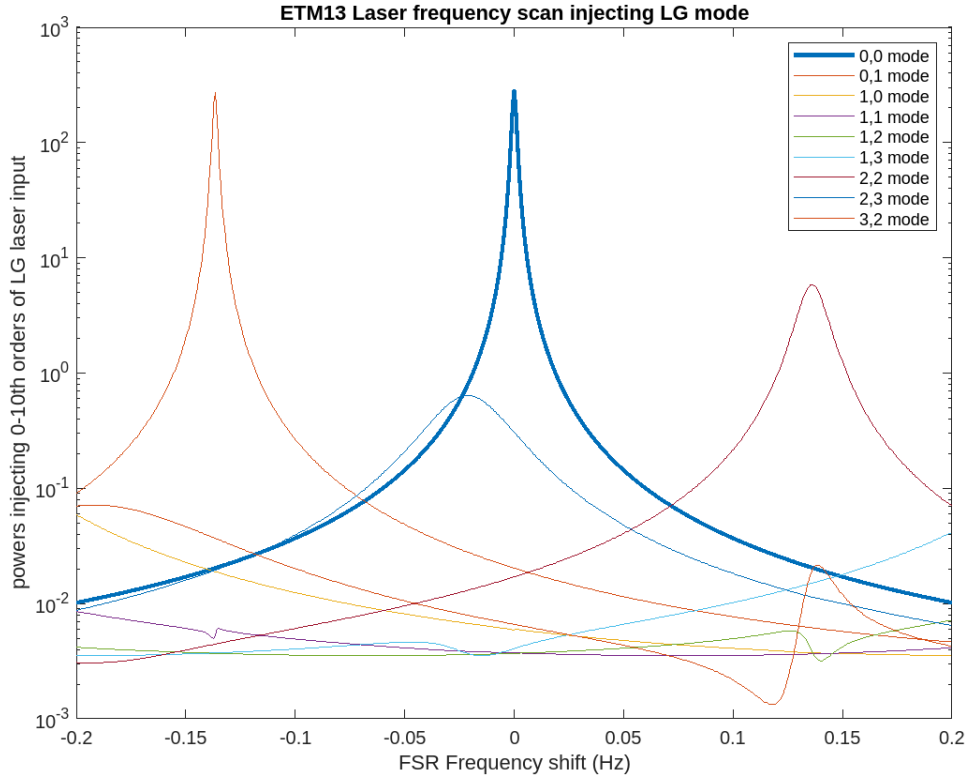


Did a few scan with LG mode for different combinations of 0-8th order as well:
For ITM07 and ETM13:





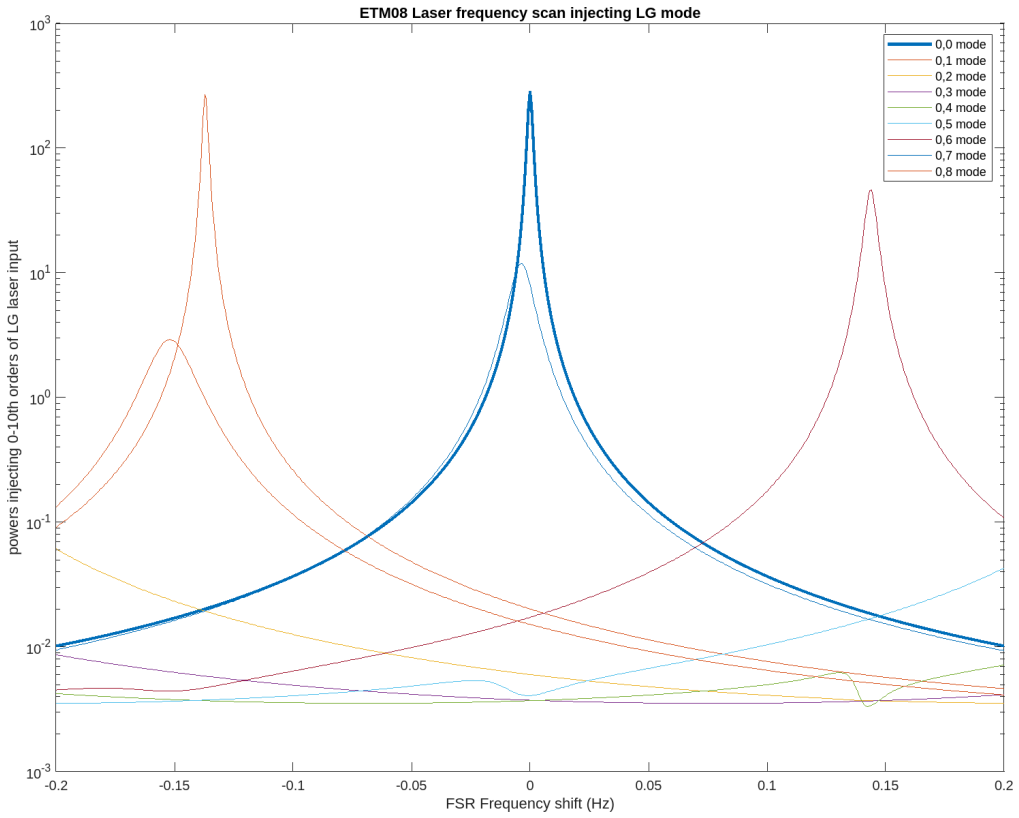
(the ETM12 as title is a typo: It should be ETM13)



From the above graphs, I tried to plot with different combinations for each LG mode (for example 0,3 and 1,1 for 3rd order), based on the three graphs above, it seems like only the top

graph have most curves within the free spectral ranged, the other graphs gives more of curves with peak outside of the spectral range, which is not as informative, so the other two mirror sets, only mode combinations like the first graph is used.

ITM04 and ETM08:



I had also tried to analyze the graph qualitatively with peak frequencies of the curve at 00th mode. This is one table made from on graph (ITM04 ETM08 7th order mode graph) However, I'm unsure if this format and what I am doing in the table is what I'm asked to do

relevant HOM	peak frequency
0,7	-0.004
2,3	-0.012
1,5	-0.008
3,1	-0.0153

Attempted to try the interception analysis but still not very clear on what it is and not sure how interceptions can be found if the graphs are made from discrete points and the points from two lines that are near the intersection region can be very close but not exactly the same. Also unsure what is meant to report power gain ratio. Is it the ratio with respect to the 00 mode power or power injected?