Explanation of CyberShake Ground Motion Extraction Code

opensha-cybershake-all.jar
This is essentially how you access all the CyberShake data and map making. You do not need to open this or do anything other than have it downloaded and in the folder you are using.

disagg_op.py
This code is used for disaggregation of hazard contributing sources to a specified area. Here is an example input to use with this code:

python3 disagg_op.py --lat=34.0 --lon=-118.24 --radius=10 --k=10 --period=0.3,1 --spacing=0.02 --gmpe=ASK_2014 --study=STUDY_22_12_HF -o DowntownLA --force_update=1

Sites within the given radius (km) of your latitude and longitude will be used for disaggregation. The code will extract site files at each period for each site and output the files to your output folder (DowntownLA in this case). You can specify multiple periods at once but make sure to change the study to “STUDY_22_12_LF” if you are using a period of 2 or greater.

This code is not really good at extracting the ground motions of CyberShake or GMPEs but it is good at disaggregating to find the sources that contribute the most hazard to your specified sites and extracting the site files. Here is an example name of site file: LADT_ERF36_Run9668_DisaggPOE_4.0E-4_SA_0.01sec_RotD50_2025_05_20.txt

Note that the disaggregation for sources is done using all the site files in your output folder, make sure you have all the periods and sites you want to disaggregate for.

Event_query.py
This code will search the CyberShake database for the specified events (source ID, rupture ID, and rupture variation ID) that contribute hazard to your specified sites at 0.3s, 1.0s, 3.0s, and PGA.

It knows which sites you are wanting to disaggregate for by which site files are in your folder. You will have to change the folder path to where you have your site files stored. It will then create a csv file called “compiled_events.csv” which will have all the hazard contributing events to your sites at the specified periods.

selected_events.csv
This is a reformatted compiled_events.csv. It is just easier to read and it is what the Plot_SA_wrapper.py and Plot_GMPE_wrapper.py code use which events to get ground motions for.

Plot_SA_wrapper.py
This will read the events in the “selected_events.csv” and extract the raw CyberShake spectral accelerations at 0.3s, 1.0s, 3.0s, and PGA. It recorded the average of 10 spatial correlation fields and automatically sorts the file by source id, rupture id, and rupture variation id.

Plot_GMPE_wrapper.py
This does the same thing as Plot_SA_wrapper.py but for the GMPEs ASK14, BSSA14, CB14, and CY14. GMPEs do not have rupture variations so they are only run for each rupture id.