Comment on acp-2021-897
Anonymous Referee #2

Stable carbon isotopes in biomass burning (BB) emissions can be used to trace the contribution of C3 plants and C4 plants to various combustion products. However, isotopic fractionation of the emitted carbon compared to the burnt fuel is unknown or uncertain due to lack of the measurements. They studied a series of laboratory fire experiments and measured stable carbon isotope signatures in the pre-fire fuels and post-fire residual char as well as in the CO2, CO, CH4, OC and EC. The isotope fractionation found this study is very important for better estimate C3:C4 ratios in the isotope-based studies.

Major concerns:

Explanation of 13C-enriched in CO should be given.

The explanation of differences of 13C fractionation in C3 and C4 should be added. Is it due to fuel or combustion condition?

What is the reason for slightly more depleted EC compared to the previous studies?

Please estimate the C3 and C4 ratio by considering different fractionation occurring in the different processes for different fuels.