

# ***Interactive comment on “Dynamic Infrared Gas Analysis from Longleaf Pine Fuelbeds Burned in a Wind Tunnel: Observation of Phenol in Pyrolysis and Combustion Phases” by Catherine A. Banach et al.***

## **Anonymous Referee #3**

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General comments: This paper report behavior of 29 gases emitted from biomass burning using two different FTIR acquisition modes (i.e. static and dynamic) as well as IR thermal imaging. Also, phenol temporal profile was characterized especially. I think the findings shown in this paper are suitable for AMT journal topic. I would recommend accepting this paper with a couple of revision and re-consideration mentioned below.

Specific comments: 1. Table 2: Category (d) includes not only aromatics (benzene, naphthalene, and phenol) but also furan-related compounds (furan and furfural). So, the term of this category should be “aromatics and furans”.

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2. page 15, line 355-356: Authors mentioned that they could not estimate the fractions of high-temperature and low-temperature pyrolysis from acetylene-to-furan ratio. But I think, they might be able to estimate those fractions by directly fitting the FTIR results of 29 gases using the high-temperature and low-temperature profiles (reported in Sekimoto et al. 2018). That is, (1) the fractions of 29 gases are extracted from the high-temp. and low-temp. profiles, and are normalized. (2) Then the FTIR data is linearly fitted by the normalized selected profiles (i.e.  $\text{VOC\_FTIR} = a \cdot \text{High-temp} + b \cdot \text{Low-temp}$ ). (3) Authors can know the fractions of high-temp. and low-temp. pyrolysis from coefficients “a” and “b”. It should be worth to do it.

3. Figure 3: Authors obtained thermal imaging for burn progression. If they could estimate the high-temperature and low-temperature fractions according to my comment #2, how do those fractions correlate with the burn temperature derived from the thermal image?

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