I find this manuscript well written and with valuable content. Its purpose appears principally to validate the indirect FAGE technique for quantitative measurement of $CH_3O_2$ by calibrating it with direct measurements using CRDS. For the most part, this goal is successfully accomplished, at least for the given FAGE apparatus.

I am generally in agreement with referee 1's comments so I will not repeat them. However, I would note that there are a few instances for which a persuasive argument can be made for maintaining the original text.

There is one area where I would ask for a clearer, more detailed presentation. I'll place my comments in terms of an equation that I consider necessary, but which has been omitted from the text. The equation relates the absorption to the desired results,

$$\alpha_t(\nu) = N\,\sigma(\nu)\,L$$

$\alpha_t(\nu)$ Is defined by equation 8 (or more precisely by equation 9) and is determined directly from the experimental observations. The N is the concentration in the vibrationless level of the ground state of $CH_3O_2$ which is the object of the experiment. The $\sigma(\nu)$ is the cross-section for absorption at a frequency $\nu$.

The $\sigma$ ($\nu$) Is obviously critical to the determined value of N, yet I find the basis for the value used rather vague. Why did the authors measure absorption at 7488 $cm^{-1}$ when Fittschen(2019) report $\sigma$ ($\nu$) at 7489 $cm^{-1}$? Given the results in figure 3, why do the authors consider the cross sections at the two wavelengths to be equal? Finally it would be helpful to have stated that the cross-section used is not the more standard integrated cross-section used by HITRAN and other databases.

The quantity, L, the length also requires further explanation. It should not refer to the 1.4 M value of the mirror separation in figure 2. (Morover, the comments on p14, line20-21 that one can improve the sensitivity by increasing the mirror separation, are incorrect.) The appropriate value of L is the effective path length of the sample, taking into account the diminishing concentration of $CH_3O_2$ near to and into the extensions that support the mirrors.

With the indicated modifications, I believe the manuscript should be published. I do however note referee number 1's comments about the desirability of publishing first the paper describing a new value for the rate constant for the self-destruction of $CH_3O_2$. Nonetheless I recognize that this may prove practically

difficult and would not place that as a stipulation for publishing the present paper.