This study isolated the fire-specific $PM_{2.5}$ from monitoring concentrations through an observation-driven method, and provides insights into the evolving dynamics of fire-specific $PM_{2.5}$ in Pacific Asia. The observed decline in overall $PM_{2.5}$ levels juxtaposed with the rising proportion of fire-specific $PM_{2.5}$ presents a concerning trend, particularly as it suggests the shift in the dominant sources of emissions from anthropogenic activities to more unpredictable fires. This shift not only complicates air quality management efforts but also disproportionately affects vulnerable populations, exacerbating public health risks. Based on the positive correlation between vapor pressure deficit and fire-specific $PM_{2.5}$ highlight the potential exacerbating effects of climate change on future air quality. Overall, this assessment is valuable to call for more attention and researches in the complex interplay of fire-specific air pollution, public health and climate change in the region. However, some issues still need to be improved:

(1) Line 28: Please provide the full name of VPD when it appears the first time in the Abstract.

(2) Introduction: The authors have discussed the necessity of studying fire-specific $PM_{2.5}$ and the related health impact in Pacific Asia, and mentioned to use the TFIM method to isolate fire-specific $PM_{2.5}$. It is suggested to briefly summerize previous methods used to estimate fire related air pollution and why the TFIM method is chosen here.

(3) Figure 1: The region has been divided into ESA, NA, CA... in this study. It is recommended for the authors to give the specific scopes of each regions in this figure.

(4) Figures: Please increase resolution of all the figures to enhance clarity, especially enlarging the text in the figures for easier reading by readers.

(5) Line 256-257: The abbreviations “SOS” and “EOS” are unnecessary as they appear only once in the text. The authors should check all abbreviations throughout the manuscript. Full name and abbreviation should be provided upon first mention in the Abstract, main text, table and figures, with abbreviations used in subsequent references.

(6) Figure 4: The figures and its captions should be standalone with enough description to be understood without having to refer to the main text. Authors should provide sufficient information in this figure caption, including what each sub-figure represents.

(7) Line 169: what does “ta positive relationship may exist ...” mean? Please rephrase this sentence.

(8) Line 292-295: Many variations are utilized for estimating fire-specific $PM_{2.5}$ in this study. It would better to list a table showing the specific variations and their information (like resolution and sources) for clarity.

(9) Line 294: The source and details of the GDP data are not provided in Data and Method. Please supplement the information.

(10) Line 305-307: The spatial-temporal resolution of these input features should not completely match the target data. How did the authors correspond them?