Dear Reviewer:
We appreciate very much for the valuable comments of our manuscript. These opinions help to improve academic rigor of our article. Based on your suggestions, we have responded the comments one by one as listed below, which is also revised in our revised manuscript.

Review comments:

1. Ln 12: "Indian Ocean summer monsoon." - Please change it to "Indian summer monsoon".

We appreciate it very much for the suggestion, and we have replaced 'Indian Ocean summer monsoon' with 'Indian summer monsoon'.

2. Ln 26: "The ASWP was more significant (insignificant) in the following year before the summer monsoon after an El Niño (La Niña) event that peaked in the previous winter." - Please rewrite the sentence for better clarity.

Thank you for pointing this out. The revised text reads as follows: "When the El Niño (La Niña) event peaked in the winter of the previous year, the ASWP that occurred before the summer monsoon was more significant (insignificant) in the following year." (line 26-28)

3. Ln 33-38: Please provide appropriate references for example, https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/asl.596 https://rmets.onlinelibrary.wiley.com/doi/abs/10.1002/qj.49712555503

Thank you for the reminder, and the citations have been added. (Rao and Sivakumar, 1999; Kurian and Vinayachandran, 2007; Nagamani et al., 2016). The added references can be found at the bottom of this reply letter.

4. Ln 41: "(SST >30.5°C) in the southeastern AS" - please specify the aswp area averaged to get this value. Because of the large variability in the ASWP area, the SST values would change based on the area considered.

Thank you for your reminding, the value here (30.5°C) is wrong, after careful check, it has been corrected to 30.8°C. And the area of the warm pool is was located between the latitudes 10°N to 13°N and longitudes 67°E to 72°E. According to your suggestion, the area range has been added to the revised paper.

5. Ln 42: "Krishnamurt et al. (1988)" - please check the author name carefully.

Thank you for pointing this out, and we have corrected 'Krishnamurt' with 'Krishnamurti'.

6. Ln 43: "Joseph (1990) also suggested that SST maxima occurred one week before the summer monsoon outbreak in the southeastern AS during 1961–1972." - It is a regular phenomena to have higher SSTs during the summer time due to high insolation and transport of warm coastal waters towards southeastern AS. The question here is whether and how these higher SST values are associated with phase of the ASWP and are consistant with the size and duration of the ASWP.

Thank you for pointing out this problem in our manuscript. I apologize for my ambiguous expression. Actually I mean that before the onset of the summer monsoon,

the warmest area of the warm pool of the tropical oceans is centred over southeast Arabian Sea. It is emphasized that the highest sea surface temperature occurs in the southeastern Arabian Sea. Following your suggestion, the description has been revised in the paper as " Joseph (1990) also suggested that before the onset of the summer monsoon, the warmest area of the warm pool of the tropical oceans is centred over southeast AS." (line 44-46)

7. Ln 48: "Arabian Sea" - Please be consistent with using the short and full form of the words. The author may consider using AS here as it was already specified in the above paragraph.

Thank you for pointing this out. After defining the short form of the word, we have replaced 'Arabian Sea' with 'AS' in the subsequent sections of the paper.

8. Ln 49: "In the second phase," - Please describe the phase. The sentence is inconsistent.

The second phase refers to the cooling phase, which has been changed to "cooling phase" in order to correspond to the "warming stage" in the previous sentence.

9. Ln 51: "He found that" - it is a good practice to avoid gender classification, instead, one can use "the author".

Thank you for your suggestions, and we have changed the above as suggested.

10. Ln 57: "They found that the Western Ghats' orographic impact decreased wind speed in the Arabian Sea's southeast and, consequently, latent heat loss, resulting in a positive heat flux into the ocean." - Please rephrase the sentence.

Thank you for pointing it out. According to your suggestions, we have revised the contents as follows: "They found that the orographic impact of the West Ghats reduced wind speed in the southeastern AS, thereby reducing latent heat loss and leading to positive heat flux entering the ocean." (line 59-60)

11. Ln 60: "Sabu and Revichandran (2011)" - Please check the spellings of author names carefully.

After careful checking, we confirmed that the spellings of author names are correct.

12. Ln 62: "intermonsoon " - a new term?

Intermonsoon, also known as inter-monsoon, refers to the interval between two monsoons. In India, there are two monsoons: the southwest monsoon and the northeast monsoon. Inbetween are two periods referred to as the intermonsoons: spring intermonsoon (March/April) and autumn intermonsoon (October/November).

13. Ln 66: "in Peninsular India" - Please change it to "tropical Indian Ocean".

Thank you for pointing this out, and we have replaced 'Peninsular India' with 'tropical Indian Ocean'.

14. Ln 69: "According to Lau (2000) and Chowdary et al. (2007)" - How does the mechanism explained by Lau (2000) and Chowdary (2007) affect the ASWP as this is mostly confined to eastern TIO, whereas ASWP centered at the central TIO?

According to Lau and Chowdary et al, the ENSO not only affects precipitation and wind speed in the eastern tropical Indian Ocean, but also heats the entire tropical

Indian Ocean by affecting shortwave radiation and latent heat flux, thereby affecting the ASWP.

15. Ln 73: "The response of the warm pool intensity to ENSO does not reach its peak until about 5 months after ENSO peaks." - Please provide a reference.

Thank you for the reminder, the citation has been added (Lau and Nath, 2003).

Lau, N.-C. and Nath, M. J.: Atmosphere–Ocean Variations in the Indo-Pacific Sector during ENSO Episodes, J. Clim., 16, 3-20, https://doi.org/10.1175/1520-0442(2003)016<0003:AOVITI>2.0.CO;2, 2003.

16. Ln 82: "IOD was more significant and persistent during the years of cooccurrence, and it was characterized by both eastern cooling and western warming." - Please provide a reference.

Thank you for the reminder, the citation has been added (Chowdary and Gnanaseelan, 2007).

Chowdary, J. S. and Gnanaseelan, C.: Basin-wide warming of the Indian Ocean during El Niño and Indian Ocean dipole years, Int J Climatol., 27, 1421-1438, https://doi.org/10.1002/joc.1482, 2007.

17. Ln 90-92: - Please rewrite the sentence for better clarity.

Thank you for pointing it out. According to your suggestions, we have revised the contents as follows: "Although the effects between the large-scale modes (such as ENSO, IOD) and the Indo-Pacific warm pool have been studied, few studies have explored the relationship between various large-scale modes and smaller-scale seas (such as the AS). " (line 93-95)

18. Ln 109: " JRA-55, the forcing field used in SODA 3.7.2," - Please provide appropriate citation.

Thank you for the reminder, the citation has been added (Carton et al., 2018).

Carton, J.A., G.A. Chepurin, and L. Chen (2018), SODA3: a new ocean climate reanalysis, J. Climate, 31, 6967-6983, https://doi.org/10.1175/JCLI-D-18-0149.1

19. Ln 114: " The data time period is from 1958 to the present." - Please provide available spatial resolution information also.

Thank you for pointing it out. According to your suggestions, we have revised the contents as follows:"The data time period is from 1958 to the present, with a spatial resolution of 0.5625°×0.5625°." (line 117-118)

20. Ln 114-115: "day-by-day" - Please change it to "daily".

Thank you for pointing this out, and we have replaced 'day-by-day' with 'daily'.

21. Ln 131: "$\partial T/\partial x$ and $\partial T/\partial y$ represent the latitudinal and longitudinal spatial variation of mixed layer temperature, respectively." - isn't it opposite? Please change the wording to zonal and meridional variation, which makes it unambiguous.

Thank you for pointing this out, and we have replaced 'the latitudinal and longitudinal spatial variation' with 'the zonal and meridional variation'.

22. Ln 135: " In this paper, the mixed layer depth has been defined as the depth at which the seawater is 0.03 kg/m3 higher than the surface density." - Please provide reference for the MLD criteria considered and justify the same. Please check https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2004JC002378.

Sorry, the definition of the mixed layer was written incorrectly here. In the revised manuscript, we select the criterion to be a density difference of 0.03 kg/m^3 between the reference depth (10 m) and the bottom of the mixed layer. This definition is consistent with De Boyer Montégut et al (De Boyer Montégut et al., 2004; Jofia et al., 2023). The reference depth is therefore chosen to avoid the diurnal cycle of the mixing layer. According to Brainerd et al.(1995), a value of 0.1 kg/m^3 sometimes yielded the depth of the main thermocline, in the case of fossil layers for example, and a value of 0.05 kg/m^3 often falls within the seasonal thermocline rather than at its top. Therefore a threshold of 0.03 kg/m^3 emerged as the appropriate value for the density criterion (De Boyer Montégut et al., 2004).

23. Ln 136: "T*h* is the temperature at the bottom 10 m of the mixed layer;" - Not clear. please elaborate.

Thank you for pointing this out. We have corrected it as " T_h is the temperature at a depth of 10 m below the bottom of the mixed layer". (line 142)

24. Ln 141: "This study also used empirical orthogonal function (EOF) analysis to separate the spatial and temporal characteristics of the ASWP and study the relationship between the ASWP and IOD/ENSO using lead lag correlation." - Please cite any earlier studies done using the similar approach.

Li (2017) studied the mechanism of cycle process between the western Pacific warm pool and ENSO by using empirical orthogonal function analysis. Kim (2012) explore the cause-and-effect relations between ENSO and warm pool variations by calculating the lead-lag correlations. The analysis methods used in this paper is similar to that of Li et al.(Kim et al., 2012; Li Xiaohui, 2017), but we focus on analyzing the results every 5 days from April to June in order to gain some new insights. The relevant references have been added to the revised paper.

25. Figure 1: Please modify the figure 1 and 2 titles by including the details of the sub-plot titles/labels and data used. I don't see the need of including June month's climatology because it is very well known than onset of southwest monsoon in the 1st week of June eventually leads to ASWP decay. You may cite a relavent work on the same in the text. Instead authors can show the March month's conditions.

Thank you for pointing this out. We have corrected it as " Figure 1: Every 5-days evolution of SST (unit:°C) in April–June, where the black contour is the 30°C contour. The dashed rectangle represents the selected range of Arabian sea warm pool (55.25°E-77.25°E, 5.25°N-20.25°N). The data is based on gridded dataset at the period of 1980-2016 from SODA v3.7.2. (https://www2.atmos.umd.edu/~ocean/)".

26. Figure 2: Please mention in the figure title or in the text, how the area was calculated.

Thank you for pointing this out. We have corrected it as " Figure 2: Time series of the area and maximum temperature of climatological ASWP, where the blue bars represent the warm pool area (km^2) and the solid line represent the maximum warm pool temperature (°C). The area of ASWP was the sea area within the rectangular range with a SST greater than 30°C. The maximum temperature was the highest temperature of the sea area with SST greater than 30 ° C within the rectangular sea

area".

27. Ln 151: " its area and maximum temperature were calculated" - Please specify how the area and maximum temperature calculation are made.

Thank you for pointing out this problem in our manuscript. According to the revised content, we have redrawn Figure 1 and 2, and added a clear description of the definition: "This paper defined a rectangle range of 55.25°E-77.25°E and 5.25°N-20.25°N based on the distribution of sea surface temperature in the AS (As shown in Figure 1, marked with a dashed rectangle). ASWP was defined as the sea area within the rectangular range with SST greater than 30°C". (line 164-166) When calculating the maximum temperature, we calculate the highest temperature of the sea area with SST greater than 30 ° C within the rectangular sea area. Corresponding modifications have also been made to Figure 1 and 2.

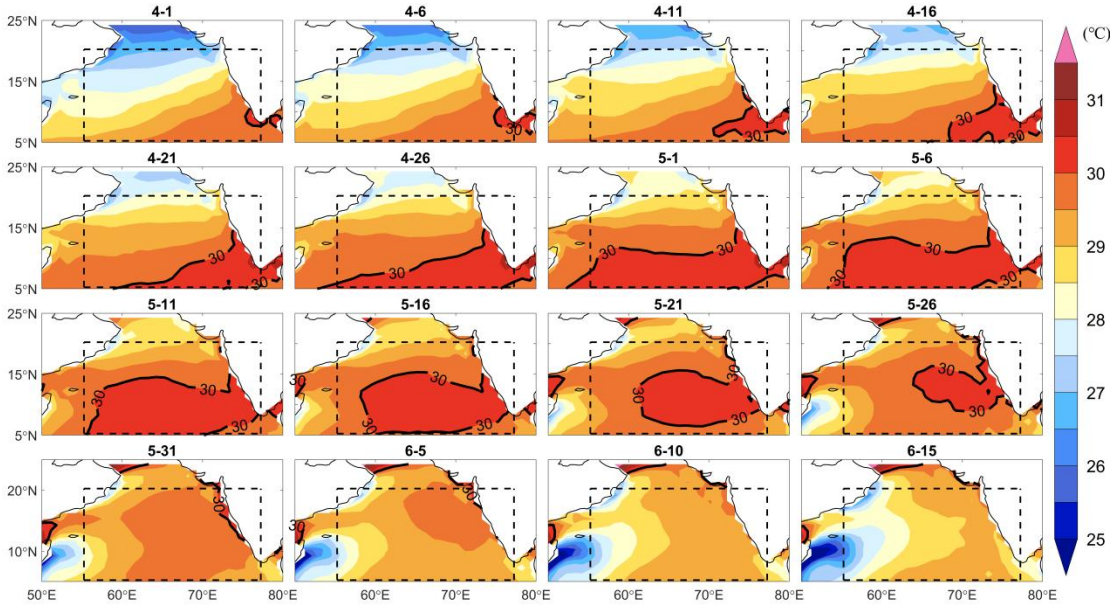

Figure 1: Every 5-days evolution of SST (unit:°C) in April–June, where the black contour is the 30°C contour. The dashed rectangle represents the selected range of Arabian sea warm pool (55.25°E-77.25°E, 5.25°N-20.25°N). The data is based on gridded dataset at the period of 1980-2016 from SODA v3.7.2. (https://www2.atmos.umd.edu/~ocean/)

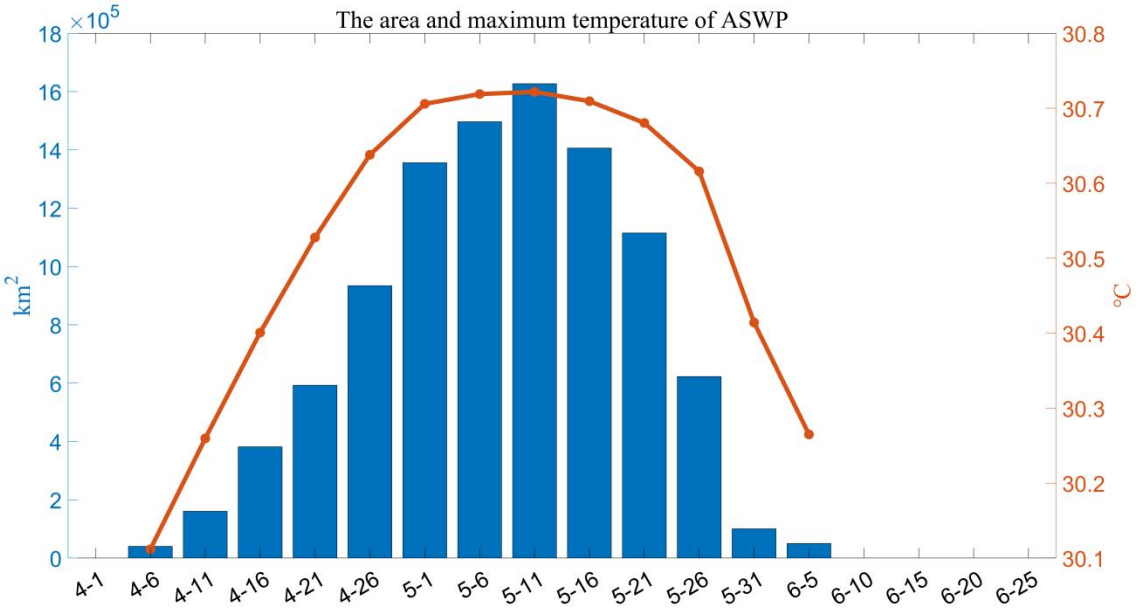

Figure 2: Time series of the area and maximum temperature of climatological ASWP, where the blue bars represent the warm pool area (km^2) and the solid line represent the maximum warm pool temperature (°C). The area of ASWP was the sea area within the rectangular range with a SST greater than 30°C. The maximum temperature was the highest temperature of the sea area with SST greater than 30° C within the rectangular sea area.

28. Ln 154-155: "when the warm pools were in a strong stage." - Please replace "strong" with "matured" or "developed".

Thank you for pointing this out, and we have replaced 'strong' with 'matured'.

29. Ln 155: "Thereafter, the warm pools decayed rapidly and disappeared almost completely in early June." - Please provide a citation.

Thank you for the reminder, the citation has been added (Rao et al., 2015).

Rao, R. R., Jitendra, V., GirishKumar, M. S., Ravichandran, M., and Ramakrishna, S. S. V. S.: Interannual variability of the Arabian Sea Warm Pool: observations and governing mechanisms, Clim. Dyn., 44, 2119-2136, 10.1007/s00382-014-2243-0, 2015.

30. Ln 155-158: - Please rewrite/rephrase the sentence for clarity.

Thank you for pointing this out. We have corrected it as " From Figure 2, it can be seen that the development and decay processes of ASWP are not symmetrical. From the formation to the mature stage of the ASWP, it takes approximately 1.5 months (6 weeks). While from the mature to disappear completely, it only takes 3 weeks. The rate of decline is twice than that of the development. The mechanism influencing this asymmetry in development and decay is discussed below." (line 172-175)

31. Ln 167: "Throughout the evolution of ASWP, the sums of SHF, ADV, and ENT were basically consistent with the trend of mixed layer temperature." - This is a strong statement. Authors can notice that, temperature change due to advection is almost constant and only SHF and ENT terms cause temperatue to decrease. Authors can draw another line with only SHF and ENT to check their

impact. Notice that their trends are not similar as stated by authors. Please give their trend values in the figure.

Based on your suggestion, we have added a new line with only SHF and ENT in Figure 3. The results indicate that the variation in temperature are mainly related to SHF and ENT, while the impact of ADV is almost constant and minimal. Due to the fact that the calculation in the figure already shows the temperature variation and the contributions of different processes to temperature variation, there is no obvious physical significance in recalculating the trend values of the lines. Moreover, there are many lines in the graph, and adding trend may make the image chaotic and complex. The relevant figure and statements have been revised in the paper.

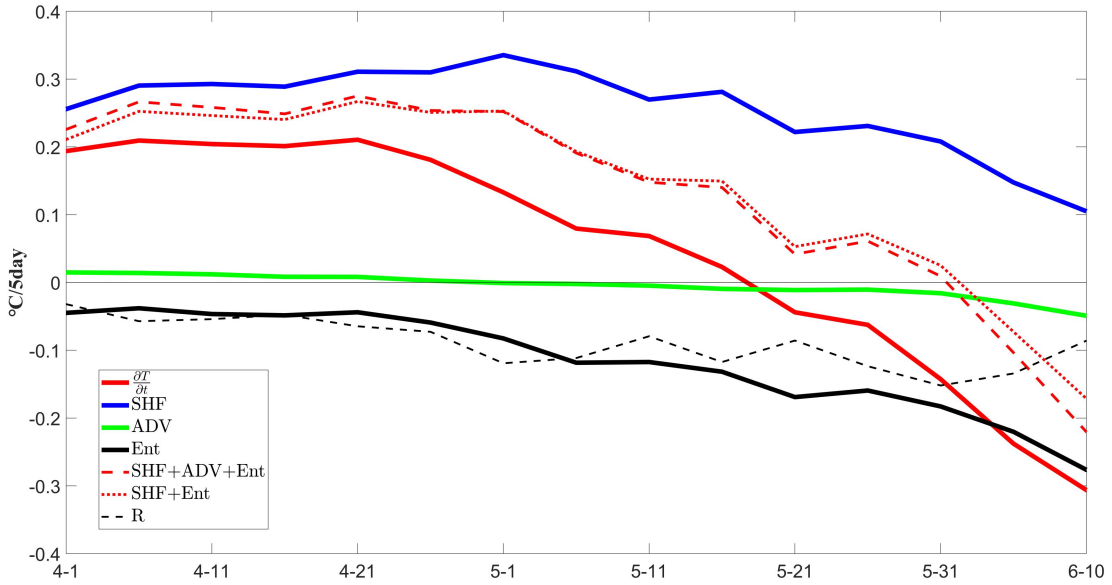

Figure 3: Contribution of different processes to the temperature variation of the warm pool mixed layer in the Arabian Sea (°C/5 day), where $\frac{\partial T}{\partial t}$ (solid red line) is the temperature variation of the warm pool mixed layer with time, SHF (solid blue line) represents the sea surface heat flux forcing, ADV (solid green line) represents the horizontal advection, ENT (solid black line) represents the vertical entrainment, and R (black dashed line) represents the residual. The red dashde line represents the sum of SHF, ADV and ENT. The red dotted line represents the sum of SHF and ENT.

32. Ln 172: "mixed layer SST" - Can't be seen from the figure. I am afraid that it is not mixed layer SST, but mixed layer temperature. Please do the necessary corrections elsewhere.

Thank you for pointing this out, and we have replaced 'mixed layer SST' with 'mixed layer temperature'.

33. Ln 173-157: - Not clear whether authors are discussing about SST or mixed layer temperature. Please take care of wording.

Thank you for pointing out. What we want to discuss here is the mixed layer temperature, and the relevant expressions have been corrected.

34. Ln 181: "net sea air heat flux" - Please check.

Thank you for pointing this out, and we have replaced 'the net sea air heat flux' with 'the net surface heat flux'.

35. Ln 194-196: - This will be true most of the time in the tropical oceans with barotropic weather being a dominated phenomenon. There are exceptions like tropical cyclones during which the loss will be higher than the SHF_net.

We agree with the reviewer's opinion. However, in our article, we are discussing the analysis results of climatology, and the results of climatology do differ from those under special weather conditions. Thank you for pointing out, and we have made revisions in the paper based on the above comments.

36. Ln 200-203: - Not true always. A persistent cloud cover may increase the longwave radiation flux. Please check and cite the following articles. https://spj.science.org/doi/full/10.34133/olar.0003 https://link.springer.com/article/10.1007/s42452-019-1172-2 Please check for contribution of downwelling longwave radiation also.

Thank you for pointing out. In our article, we discuss the analysis results of climatology. Based on your suggestion, we have plotted the average long wave radiation, short wave radiation, sensible heat, and latent heat fluxes of ASWP (Figure 4). It can be seen that in the Arabian Sea, although the downward long wave radiation flux is stronger than the downward short wave radiation flux, the net long wave radiation is upward and smaller due to the upward long wave radiation flux being greater than the downward long wave radiation flux. Due to the small amount of upward shortwave radiation, the net shortwave radiation is downward and larger, indicating that the ocean is more affected by shortwave radiation flux at this time.

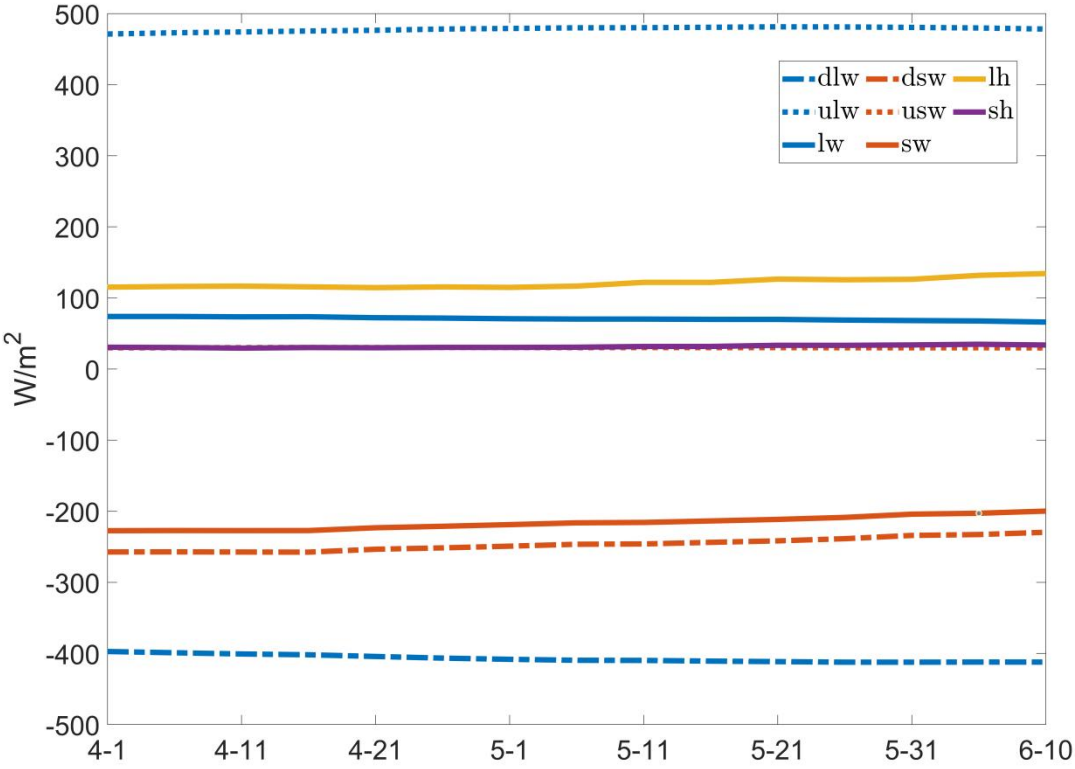

Fig. 4. The average heat fluxes of ASWP. The blue solid line represents the net long wave radiation flux, the orange solid line represents the net short wave radiation flux, the yellow solid line represents the latent heat flux, and the purple solid line represents the sensible heat flux. The dashed line represents the downward radiation flux, while the dotted line represents

the upward radiation flux.

37. Ln 209: “variation of SST was roughly” - SST or mixed layer temperature? Please check and modify elsewhere in the following text.

Thank you for pointing out, and here refers to the mixed layer temperature. The relevant statements have been revised in the paper.

38. Ln 217-221: Authors can discuss the impact of cloud cover and the entrainment and vertical velocity increasing cool subsurface water to change the mixed layer temperature. Here comes the impact of the MLD criteria one would choose.

Thank you for your suggestion. The impact of cloud cover on the mixed layer temperature has been analyzed in the second paragraph of 3.2.1, and the cooling effects of entrainment and subsurface water have been analyzed in section 3.3.2.

39. Ln 231: “SST” - mixed layer temperature?

Thank you for pointing this out, and we have replaced ‘SST’ with ‘mixed layer temperature’.

40. Ln 244: “non-solar radiation flux” - Authors may elaborate what do they mean by "non-solar radiation flux".

Thank you for pointing out. The expression of 'non solar radiation flux' is inappropriate, and has been changed to 'non-shortwave radiation' in the revised paper.

41. Ln 264-267: - Can't understand what do author's want to convey. Please rewrite and provide reason in this section to support using more appropriate citations.

Thank you for pointing out this problem in our manuscript. I apologize for my ambiguous expression. We have revised the contents as follows: “During November and December, there is an equatorward-flowing East India Coastal Current (EICC) off the east coast of India. This current flows around Sri Lanka and continues as a poleward-flowing West India Coastal Current off the west coast of India (Shetye et al., 1996; Rao and Sivakumar, 1999; Mukhopadhyay et al., 2020).”. (line 275-277)

42. Figure 9: Not clear whether area calculated is monthly or pentade? Please provide details.

The area calculated in figure 9 is daily mean every 5 days. Thank you for your suggestions, and we have added detailed instructions in Figure 9.

43. Figure 10: Not clear if this is a pentade mean? Please give more details on the figure to make it clear.

The area calculated in figure 10 is daily mean every 5 days. Thank you for your suggestions, and we have added detailed instructions in Figure 10.

44. Ln 311: “The first mode variance contribution for April, May, and June was all greater than 50%.” - Where is it shown?

Thank you for your suggestion, the variance contribution of each mode has been added to the figure 5.

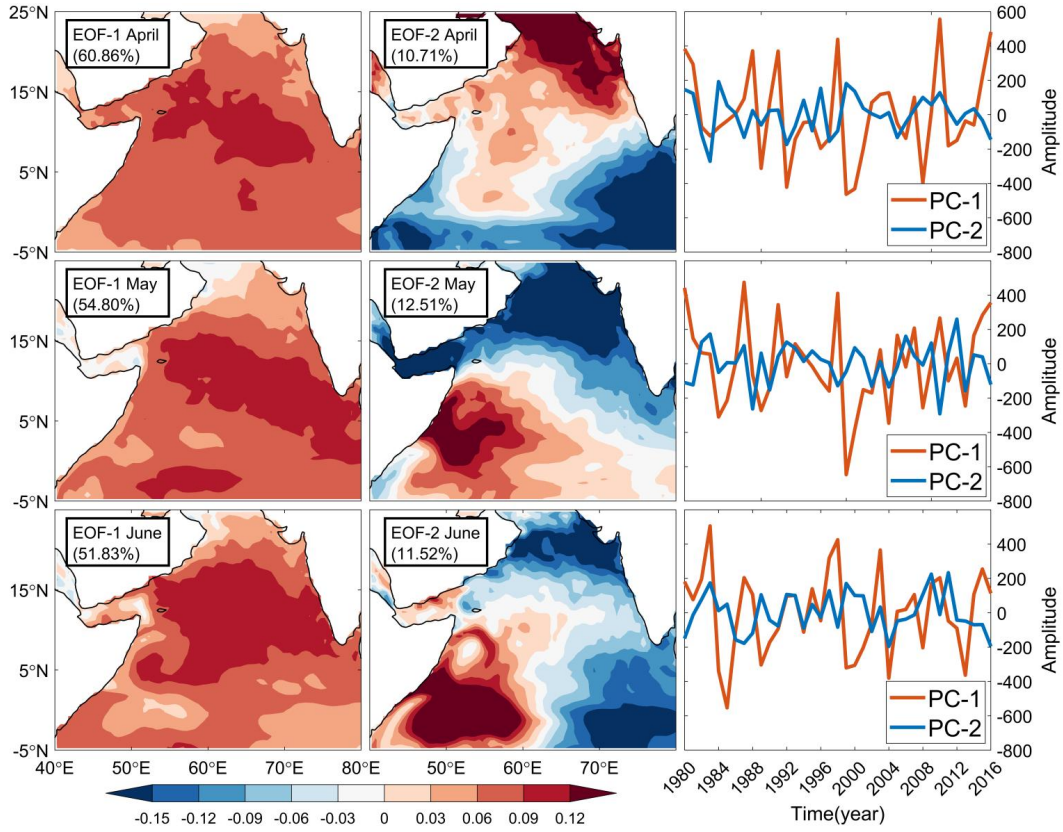

Figure 5: EOF1 (the first column), EOF2 (the second column), and PC1 and PC2 (the third column) of SST anomalies in the Arabian Sea for April–June.

45. Ln 315: "1987, 1991, 1998, 2010, and 2016" - How do you explain the change in peaks for June month? Similarly explain the negative peaks in PC.

The occurrence of tropical cyclones can affect changes in mixed layer temperature significantly. There are few tropical cyclones in April and May, so the temperature is mainly affected by IOB at this time. June is the peak period for the occurrence of tropical cyclones in the Arabian Sea (Zihan et al., 2023), so the temperature in June is more affected by tropical cyclones. Due to the complex interannual variations of tropical cyclones, which are not always consistent with the changes in IOB, the peaks of PC1 in June differs from the peaks in April and May.

46. Ln 320-322: - Not clear what do the author's mean here?

Thank you for pointing out, and I apologize for my ambiguous expression. Following your suggestion, the description has been revised as: "The variance contribution of the second mode (10.71%, 12.51% and 11.52%) was smaller than the first mode. The spatial distribution patterns vary each month, but there are at least two antiphase extreme centers. The amplitude of PC2 change every month is smaller than the amplitude of PC1." (line 348-350)

47. Ln 325: "The IOB is the first mode of the Indian Ocean and characterized as a consistent warming or cooling at the Indian Ocean basin scale (Xie et al., 2009).”- Please rewrite. Can't understand what do author's want to convey?

Thank you for pointing it out. We have revised the contents as follows: "A basin-scale warming/cooling is the leading mode of tropical Indian Ocean temperature variability on interannual time scales. It peaks in late winter and persists into the

following spring and summer (Klein et al., 1999; Li et al., 2008). ” (line 304-305)

48. Ln 331: “The left panel of Figure 13 shows that the PC-1 of ASWP was positively correlated with the IOD most of the time.” - It is a strong statement. Can't be seen in the figure. There are many undulation in the correlations which contradicts this statement.

Thank you for pointing out. Based on and in conjunction with your suggestion No. 50, the content of this section has been revised as follow: “The left panel of Figure 13 shows that the highest correlation coefficient between the PC1 and IOD reached 0.56 ($p<0.01$), indicating that the ASWP had a significant correlation with the IOD. There are three peaks in the lead-lag correlation between PC1 and IOD. The first peak appears at -5, -7, and -8 months (r=0.48-0.56), indicating that the mixed layer temperature lags behind the IOD for 5-8 months. It also means that the temperature from April to June has a higher correlation with the previous winter's IOD. This is consistent with that the IOD peaks in winter (Li et al., 2008). The second peak appears at -2, -1, and 0 months (r=0.36-0.49), indicating that the IOD can also regulate the temperature in near real-time. The third peak appears at 7 months (r=0.14-0.34), indicating that the temperature is not only regulated by IOD, but can also affect the IOD mode, although the effect is relatively small. This is consistent with the research results of Li et al (2008). ” (line 359-366)

49. Ln 336-338: “ You can cite the most recent research on this topic. Please refer following articles. https://www.nature.com/articles/s41598-023-32840-w https://www.nature.com/articles/s41612-020-0127-z https://www.nature.com/articles/s41598-018-30552-0

Thank you for your suggestion. The latest research articles have been cited in the revised paper.

50. Ln 342: “It can be seen that the ASWP was most correlated with a lag of 5–7 months in the niño3.4 index, indicating that it was modulated by the ENSO.” - From figure 12 and 13, the ESNO impact is stronger than IOD and leading the correlations. How can authors explain this. Also, please describe 3 peaks in the IOD correlation in relation to a smooth decay in ENSO correlation.

From Figure 13, it can be seen that there are three peaks in the lead-lag correlation between PC1 and IOD. The first peak appears at -5, -7, and -8 months (r=0.48-0.56), indicating that the mixed layer temperature lags behind the IOD for 5-8 months. It also means that the temperature from April to June has a higher correlation with the previous winter's IOD. This is consistent with that the IOD peaks in winter (Li et al., 2008). The second peak appears at -2, -1, and 0 months (r=0.36-0.49), indicating that the IOD can also regulate the temperature in near real-time. The third peak appears at 7 months (r=0.14-0.34), indicating that the temperature is not only regulated by IOD, but can also affect the IOD mode, although the effect is relatively small. This is consistent with the research results of Li et al (2008). The correlation coefficient between PC1 and the Niño3.4 index is highest at a lag of 5-7 months (r=0.61-0.72), and sharply decreases after -2 months. This indicates that the temperature in the Arabian Sea is more regulated by ENSO. On the one hand, ENSO can directly affect the temperature changes in the Arabian Sea through atmospheric

bridges (Lau and Nath, 2000; Chowdary and Gnanaseelan, 2007); On the other hand, ENSO can indirectly regulate the temperature changes by influencing the IOD (Behera et al., 2006). So, the correlation coefficient between ENSO index and PC1 is higher than that of IOD, and the impact is stronger. According to your suggestion, the relevant content has been added to the revised paper.

51. Ln 349: "Can changes in the ENSO affect the role of different processes in the evolution of the ASWP? " - Interesting. can you also include similar analysis with positive and negative IOD years?

Thank you for your suggestion. In fact, we have conducted similar analysis with positive and negative IOD years, but the calculation results indicate that there is not much difference, so we did not include it in the paper for discussion.

52. Ln 354: "SST warmed" - still not clear. Is it SST or mixed layer temperature?

Thank you for pointing out, and here refers to the mixed layer temperature. The relevant statements have been revised in the paper.

53. Ln 354-356: "still not clear. Is it SST or mixed layer temperature?" - Please explain this in detail with appropriate citations?

Thank you for pointing out, and here refers to the mixed layer temperature. The effect of vertical entrainment was enhanced may be related that the convective organization becomes more frequent throughout the tropics, and especially over warmer ocean waters, during El Niño (Sullivan et al., 2019).

54. Ln 366: "SHFQnet was related to SWR," - Not entirely true. Please check and modify.

Thank you for your suggestion. This has been modified to ' $SHF_{Q_{net}}$ was mainly related to shortwave radiation'.

55. Ln 368: "SHFQloss was related to the depth of the mixed layer and increases with the onset of the summer monsoon." - Also on the stratification/properties of the subsurface water including halocline and thermocline variability.

Thank you for your suggestion. Due to the word limit of the paper, the conclusion here is relatively brief, and a more detailed analysis is provided in Chapter 3.2.

56. Ln 382: "which is consistent with the strength of the IOWP peaking about five months after the ENSO peaked." - Please give proper citations.

Thank you for the reminder, the citation has been added. (Lau and Nath, 2003)

Reference：

Behera, S. K., Luo, J. J., Masson, S., Rao, S. A., Sakuma, H., and Yamagata, T.: A CGCM Study on the Interaction between IOD and ENSO, J. Clim., 19, 1688-1705, https://doi.org/10.1175/JCLI3797.1, 2006.

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