

Interactive comment on “Forced and internal modes of variability of the East Asian summer monsoon” by J. Liu et al.

J. Liu et al.

Received and published: 1 September 2008

Thank you for your careful reading and constructive comments. Below is our point-by-point reply.

1. Line 9 on page 651. Need to clarify whether the PC1 minimum tends to occur in developing or decaying La Nina years before 1990.

If we define the first year as the developing year, then before 1990, PC1 minima occur in 1981, 1984, and 1985, in which 1981 and 1984 are La Nina developing years, while 1985 is a decaying La Nina.

2. Line 17 on page 651. Are developing or decaying La Nina conditions for these five out of the six years listed? Need to clarify.

These five La Nina years (1981, 1984, 1995, 2000, and 2005) are all developing La

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Nina years except 2000.

3. Lines 10-20 on page 652. One important feature of SST anomalies associated with EOF1 shown in figure 3 is the developing positive SST anomalies in the tropical Indian Ocean and over Maritime continents. What is the role of these SST anomalies for the formation of anomalous WNP anticyclone? Need to comment and clarify.

This is an interesting question. It has been speculated that the positive Indian Ocean SST anomaly may play a role in sustaining the WNP anticyclone. The Indian Ocean and MC warming during and after the mature phase of El Niño is a delayed response to remote El Niño forcing through an atmospheric bridge. These anomalies are located to the west and southwest of the WNP anticyclone. In theory, such anomalies may affect the atmospheric circulation in situ or to the west of these SST anomalies. Thus, these SST anomalies should not have a major impact on the WNP anticyclone. However, the MC warming may draw anomalous easterly along the equator in the western Pacific, which could reinforce the southern flank of the WNP anticyclone.

4. Line 12 on page 653. Need to clarify how the ENSO-induced anomalous Walker cell influences EASM.

During a La Niña, for instance, the eastern Pacific is colder than normal, which induces an anomalous Walker cell that is sinking in the eastern Pacific while rising over the maritime continent. In this case, the convection and rainfall over the maritime continent are enhanced. The enhanced maritime continent rainfall will affect East Asia by setting up an anomalous meridional (Hadley type) cell, which normally takes a sandwich pattern as shown by the leading mode (wet maritime continent, dry WNP monsoon trough, and wet East Asian subtropical front).

5. Lines 32-33 on page 659. Wang and Xu (1999) is not cited in the paper.

Deleted.

6. Figure 2 on page 662. Need to give a scale of wind.

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Figure 2 has been revised by adding the wind speed scale.

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