**Reading guidelines for Lecture 07: East Asian summer monsoon**

**Part one: synoptic climatology**

1. Why there exists the western North Pacific summer monsoon (WNPSM) as its counterpart, the western North Pacific winter monsoon, is absent?
2. Notions should be given to describe the origin of summer monsoon over East Asia and its development from March to May.
3. Notions should be given to describe the three sources of moisture for East Asian summer monsoon.
4. The onset date of EASM is in general a couple of weeks earlier than ISM (see Fig. 5.9). Please discuss the possible reasons.
5. Notions should be given to the role of ridge line during the development of Tibetan Plateau summer monsoon.
6. Meiyu constitutes the subtropical frontal system, which is the term TCZ used in the reference.
7. The TCZ owes the characteristic of baroclinic disturbances in the upper level (prevailing in the winter) and transported moisture steered by the veered Pacific anticyclone in the low level (as season marches into the summertime), forming the dilatation axis (against contraction axis) of the deformation field.
8. There are a series of vortices (Chinese scientists call them southwestern vortices) develops associated with the Meiyu front. Often, the heavy rainfall concentrates in the southeast quadrant of the vortex. Can you figure out the possible reasons?
9. Climatologically, the Meiyu rainfall amount is found to be anti-correlated with the strength of monsoon current. Discuss the possible causes.
10. Meiyu (over China) is more like a tropical system whereas the Baiyu (over the East China Sea and Japan) has a typical midlatitude baroclinic structure (see Figs. 5.11 and 5.12). The former is truly a subtropical front. The latter is an extra-tropical front.
11. Sudden jump: the activity of summer monsoon over Central China rapidly shifts to Northern China, Korea, northeastern Siberia (including the Manchuria), and Japan during the months of July and August. Discuss the evidences shown in the climatological fields of mean sea level pressure, circulation, and rainfall distributions.

**Part two: variability**

1. The EASM/WNPSM is a continental/oceanic monsoon system.
2. The EASM/WNPSM consists of subtropical front, subtropical high, and monsoon trough over the adjoining region.
3. Notions should be given to the spatially-varying diurnal rainfall cycle across the China.
4. Rainfall has two types: convective and stratiform types.
5. EASM circulation has a weakening trend since the late 1970s. Following this trend, there was a trend toward “southern-flooding-and-northern-drought” pattern. However, the recent weakening of EASM is not unprecedented in the 20th century. *What is the implication here?*
6. What are the proposed mechanisms responsible for the EASM weakening?