

Diagnostic Metrics

Asian-Australian Monsoon

Domain: 30S-40N, 40E-170E

Observational Data: GPCP precipitation, OLR, NCEP/DOE reanalysis, ERSST,

Validation Measures: Pattern Correlation Coefficient (PCC) and Root Mean Square Error (MRSE) are standard measures unless otherwise specified.

Fig. 1 Annual Mean (AM): Precipitation/SST/uv850 climatology (Precipitation: Color, SST contour).

Fig. 2: Annual Cycle 1 (AC solstice mode): JJAS minus DJFM Precipitation/SST/uv850 climatology.

Fig. 3: AC2 (Equinoctial asymmetric mode): AM minus ON Precipitation/SST/uv850 climatology.

Fig. 4: Monsoon precipitation domain (MPD) and intensity (MPI). Use PCC for MPI and threat score for MPD as measures.

Fig. 5: Climatological Monsoon Onset/Peak using pentad rainfall at 5X5 grid. Use first 12 harmonics to form the pentad mean annual time series.

Fig. 6: Interannual variability (IAV): First two leading modes of Season-reliant EOF (JJA (0), SON (0), D(0)JF91), MAM(1)) of precipitation and uv850. In validation, take the four panels together to calculate PCC and RMSE.

Fig. 7: ENSO-Monsoon relationship: Lead-lag correlation of ENSO index with three regional monsoon circulation indices: (1) ISMI: U850(5°–15°N, 40°–80°E) minus U850(20°–30°N, 70°–90°E), (2) WNPSMI: U850(5°–15°N, 100°–130°E) minus U850(20°–30°N, 110°–140°E), (3) Australian monsoon index (AUSMI) U850 (5 °S–15 °S, 110 °E–130 °E).

Fig. 8: Intraseasonal Variability (ISV): 25-70 day variance of OLR for JJA and DJF.

Fig. 9: ISV: First two OLR EEOF modes (5-day interval). For validation take three panels together to compute PCC and RMSE.

Fig. 10: Diurnal Cycle (DC): The first two leading EOF modes of climatological time series, at least have 3-hour interval).

1. Annual Mean and Cycle

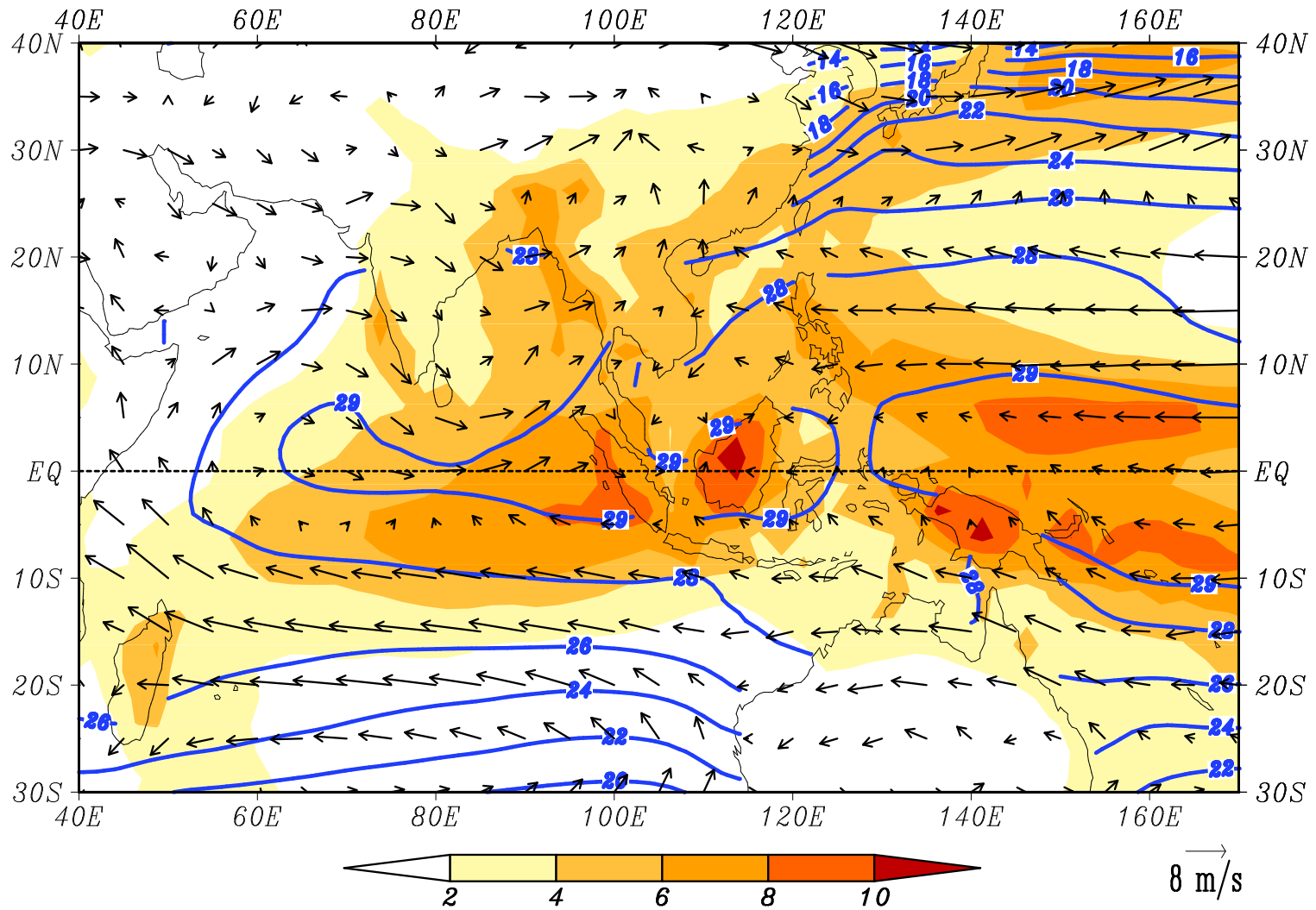


Fig. 1 Annual Mean (AM): Precipitation/SST/uv850 climatology (Precipitation: Color, SST contour).

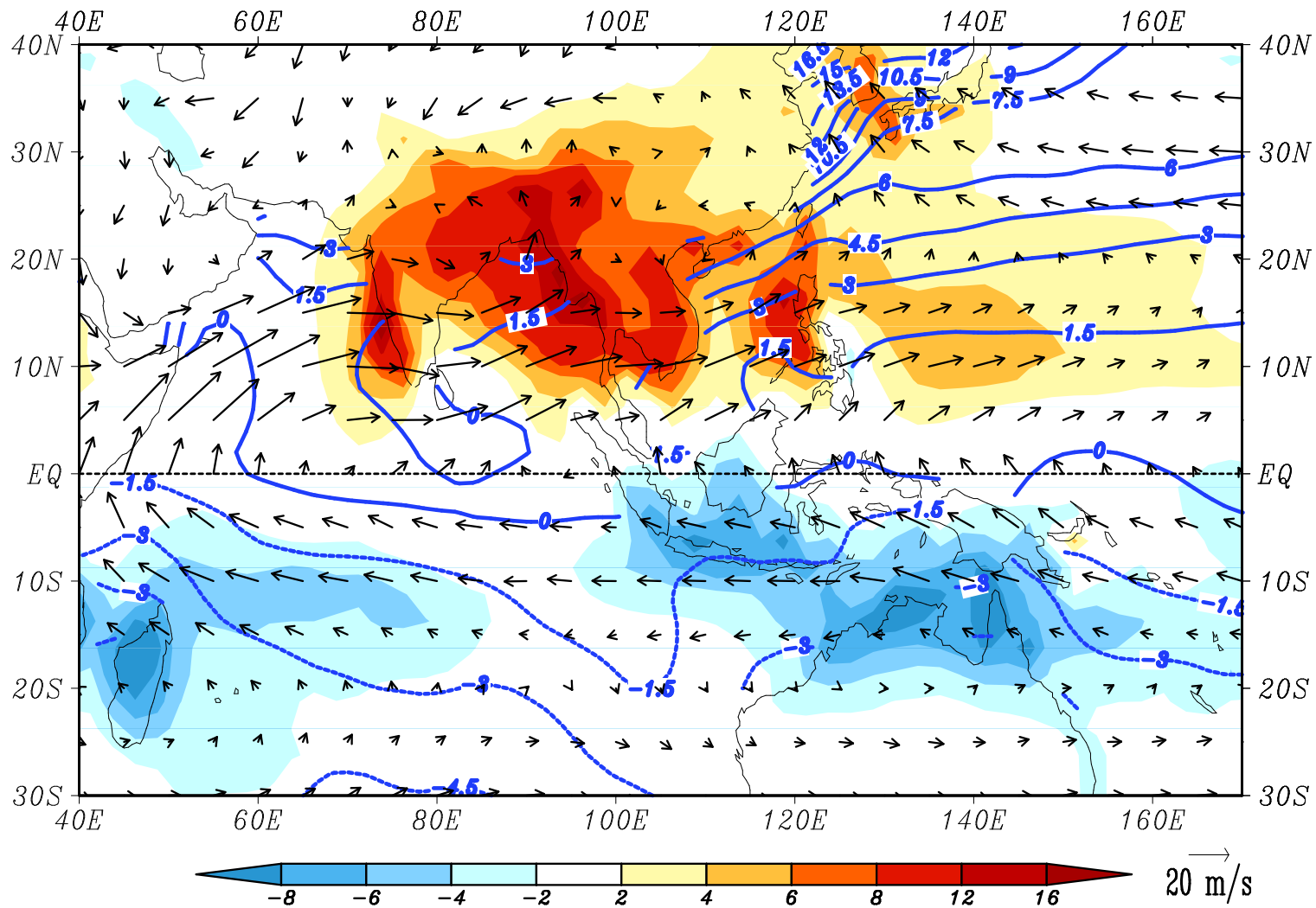


Fig. 2: Annual Cycle 1 (AC solstice mode): JJAS minus DJFM
Precipitation/SST/uv850 climatology.

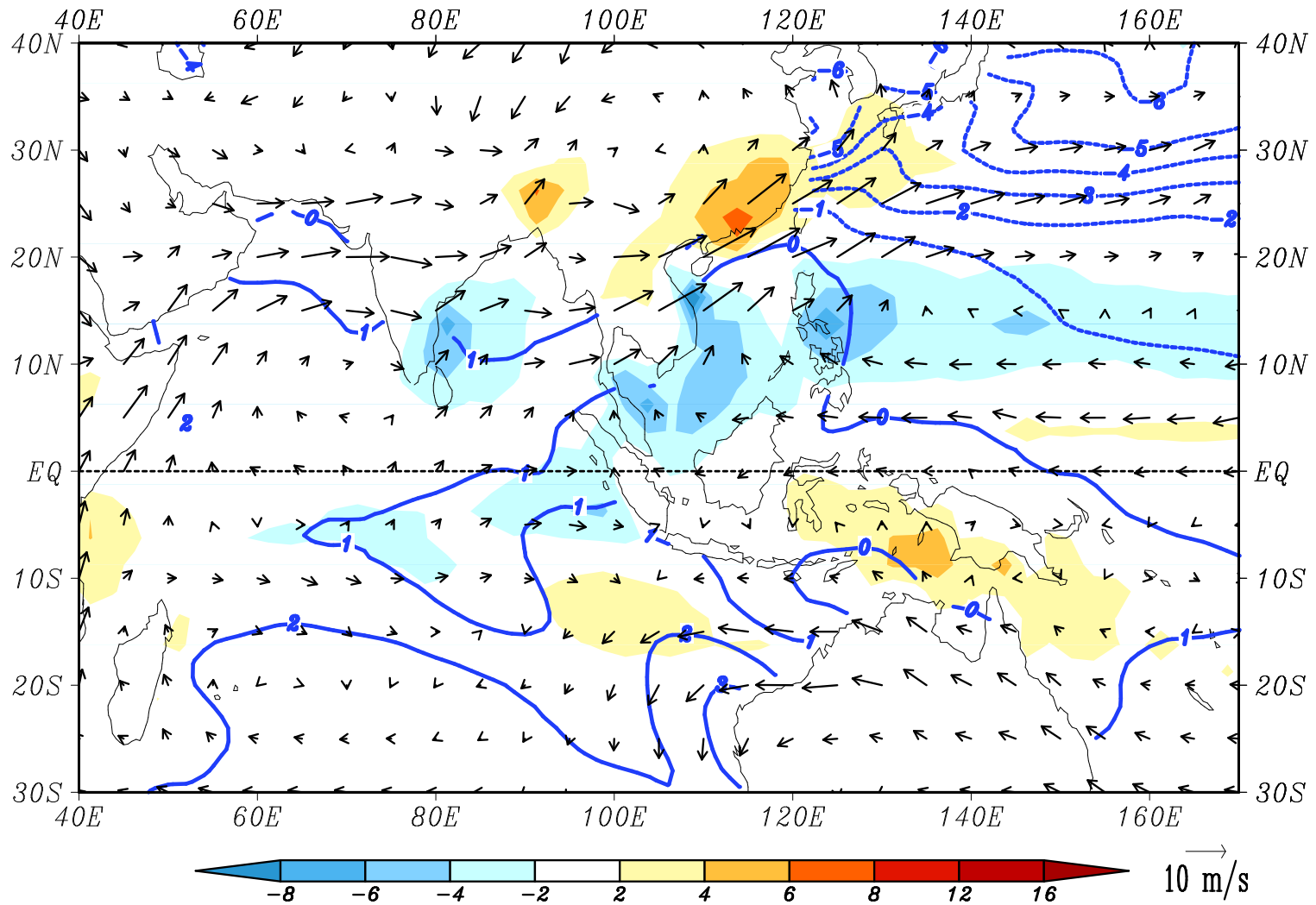


Fig. 3: AC2 (Equinoctial asymmetric mode): AM minus ON
Precipitation/SST/uv850 climatology.

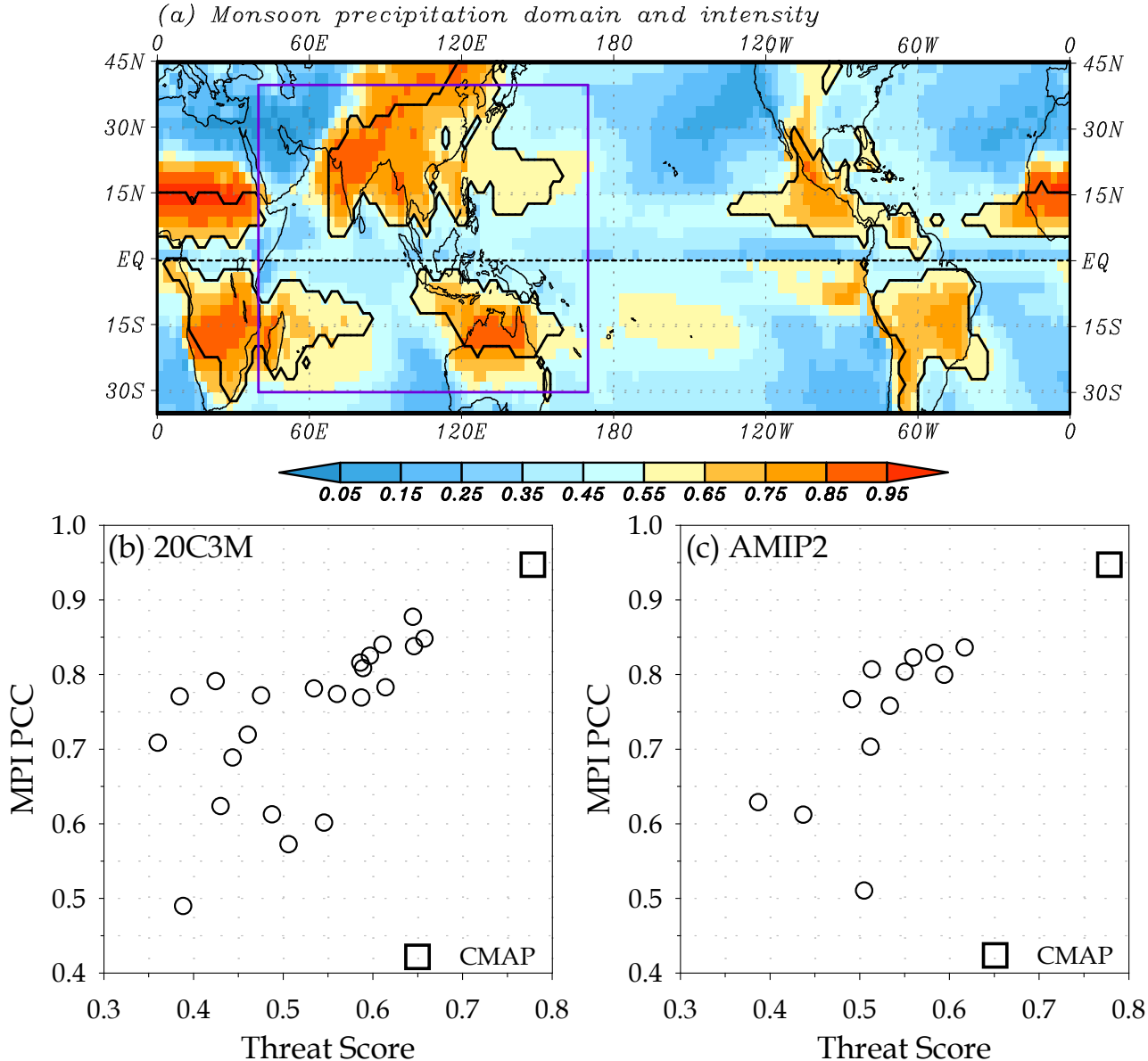
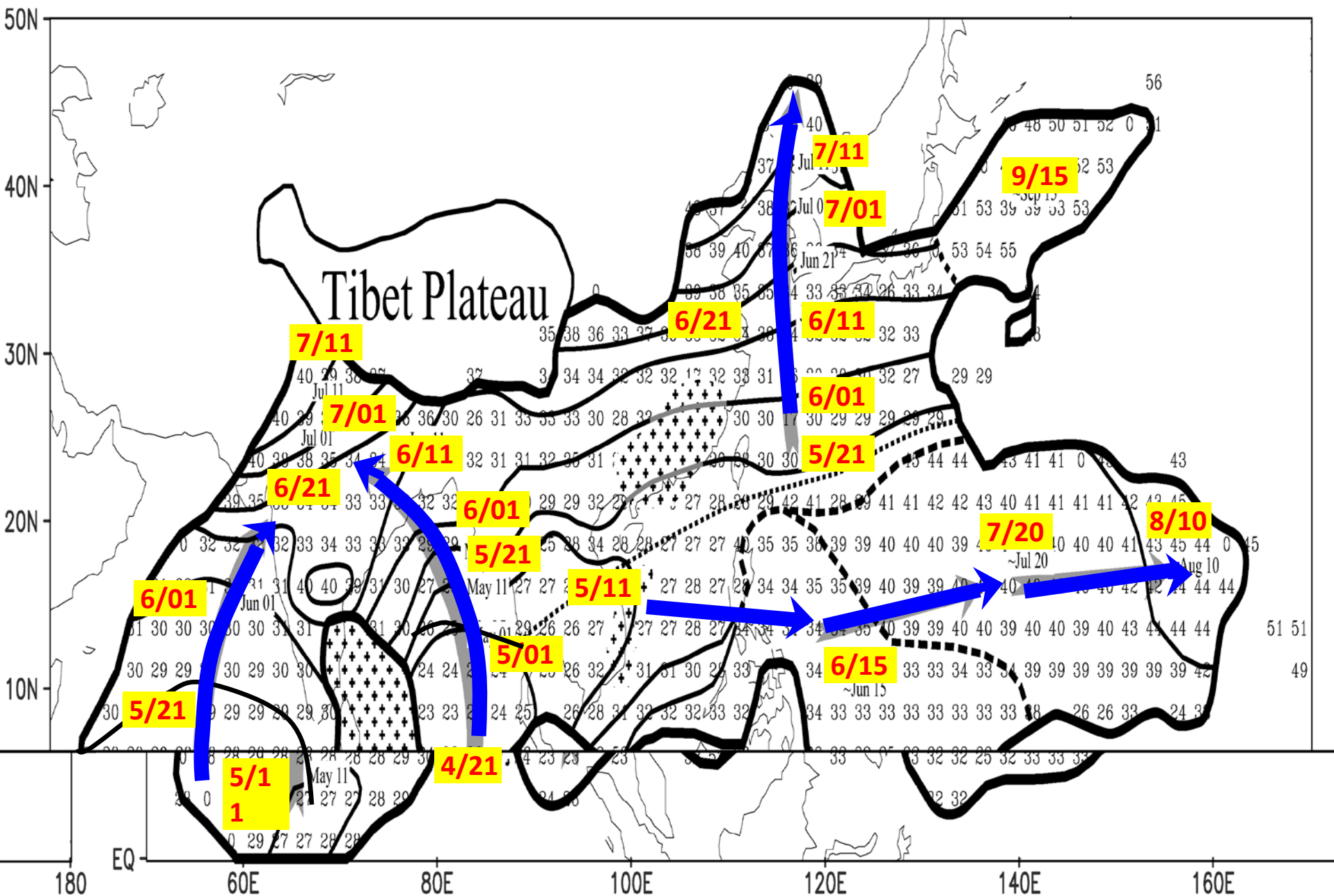


Fig. 4. (a) Monsoon precipitation domain (MPD) and intensity (MPI). The MPD was defined by the local summer minus winter precipitation rate exceeding 2.0 mm day^{-1} and the local summer precipitation exceeding 55% of the annual total. Here the local summer denotes May through September (MJJAS) for NH and November through March (NDJFM) for SH. (b)-(c) pattern correlation coefficients (PCC) for MPI and threat score (TS) for MPD over Asia-Australia monsoon regions [box in Fig. 4(a)] for 20C3M and AMIP2, respectively.

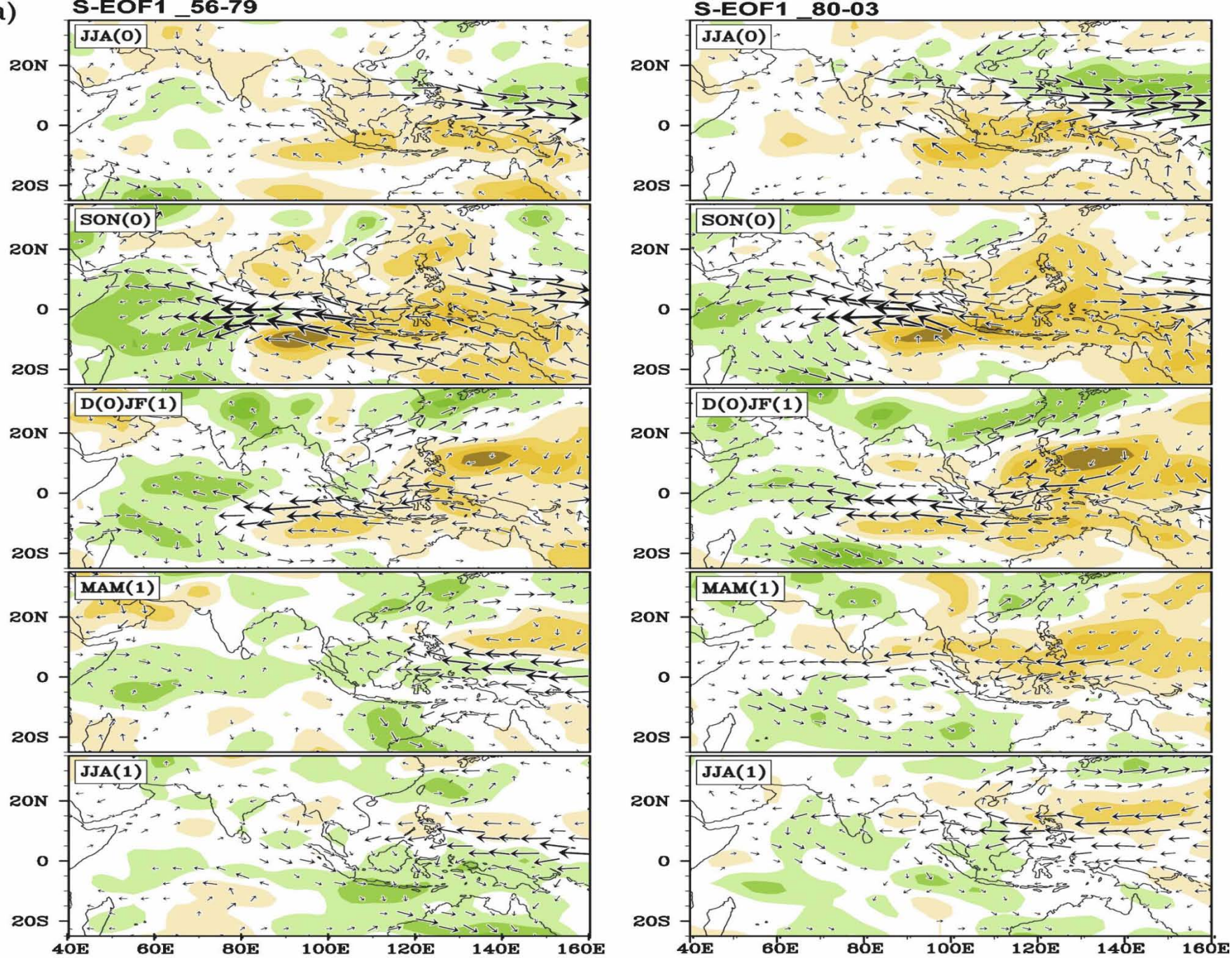
Onset Date (Climatology 1979-2001)

Wang and LinHo 2002



2. Interannual Variation

(a)



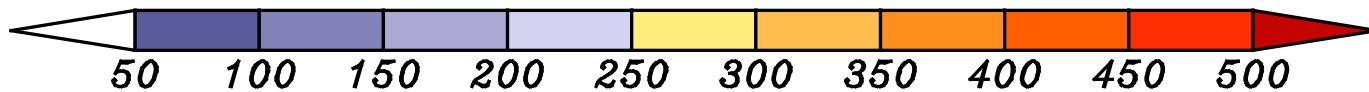
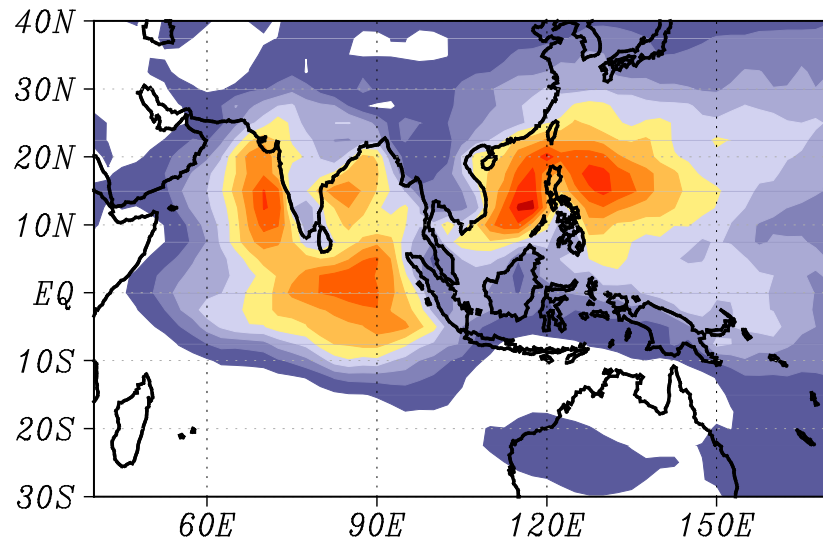
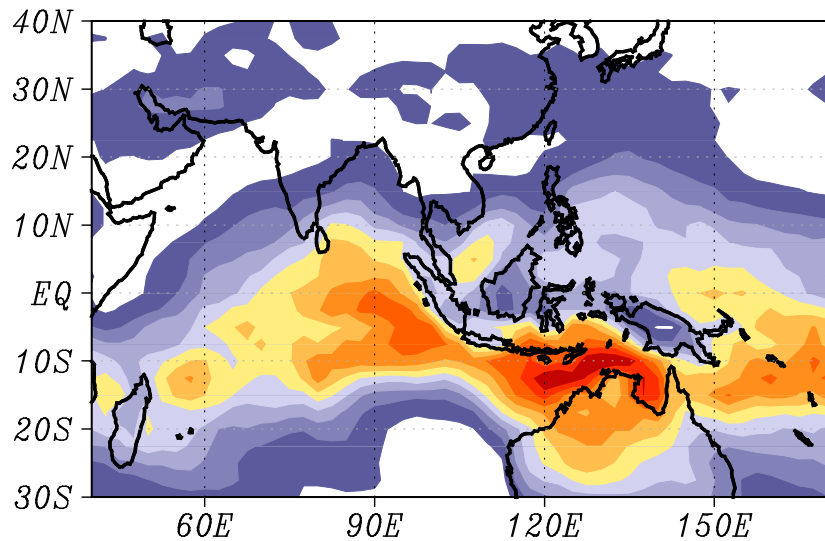
3. Intraseasonal Variation

ISO variance

DJF

25-70 day variance

JJA



W²/m⁴

Fig.8

ISO

DJF

JJA

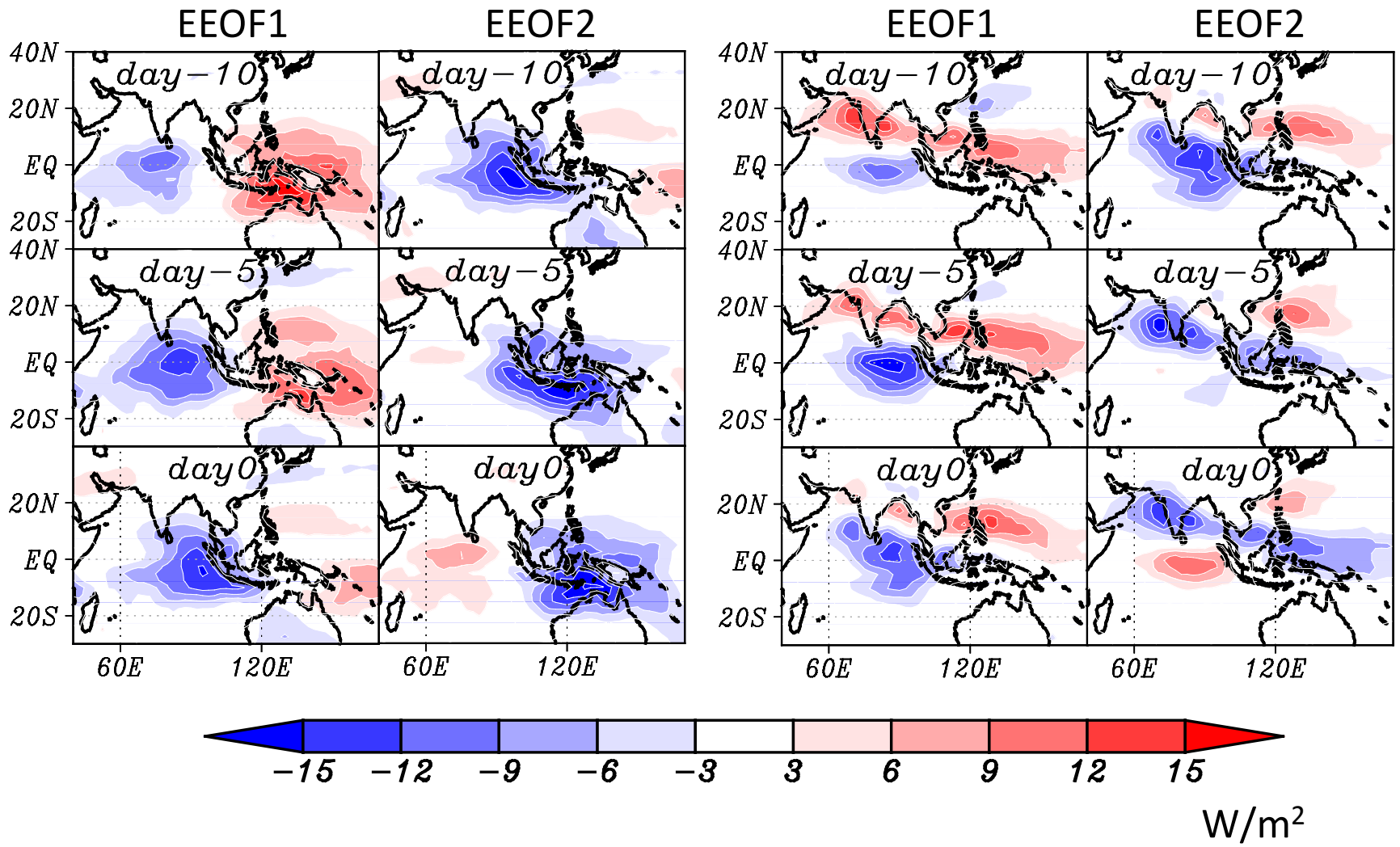


Fig. 9

4. Diurnal Cycle

Diurnal Cycle

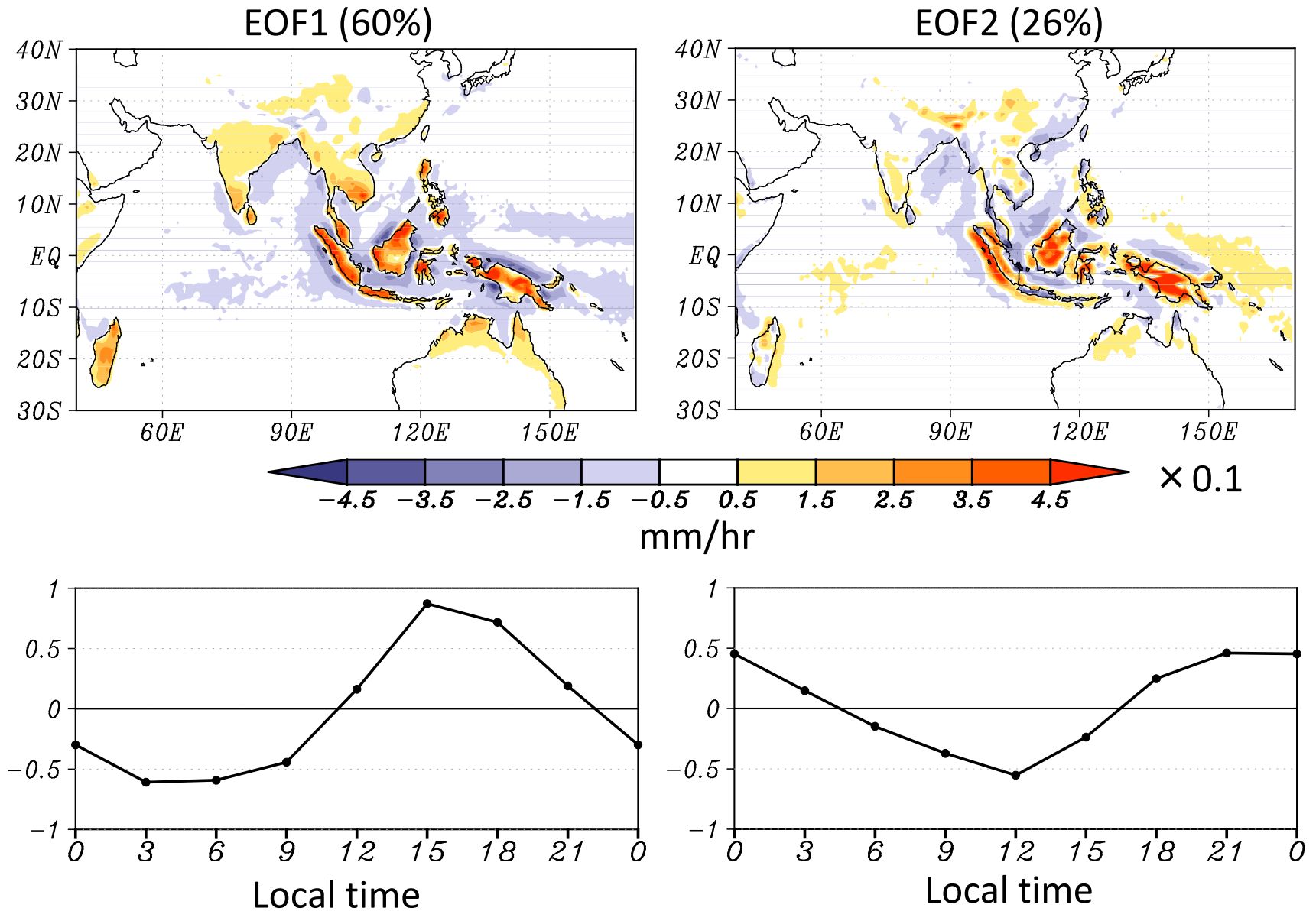


Fig. 10

Intercomparison

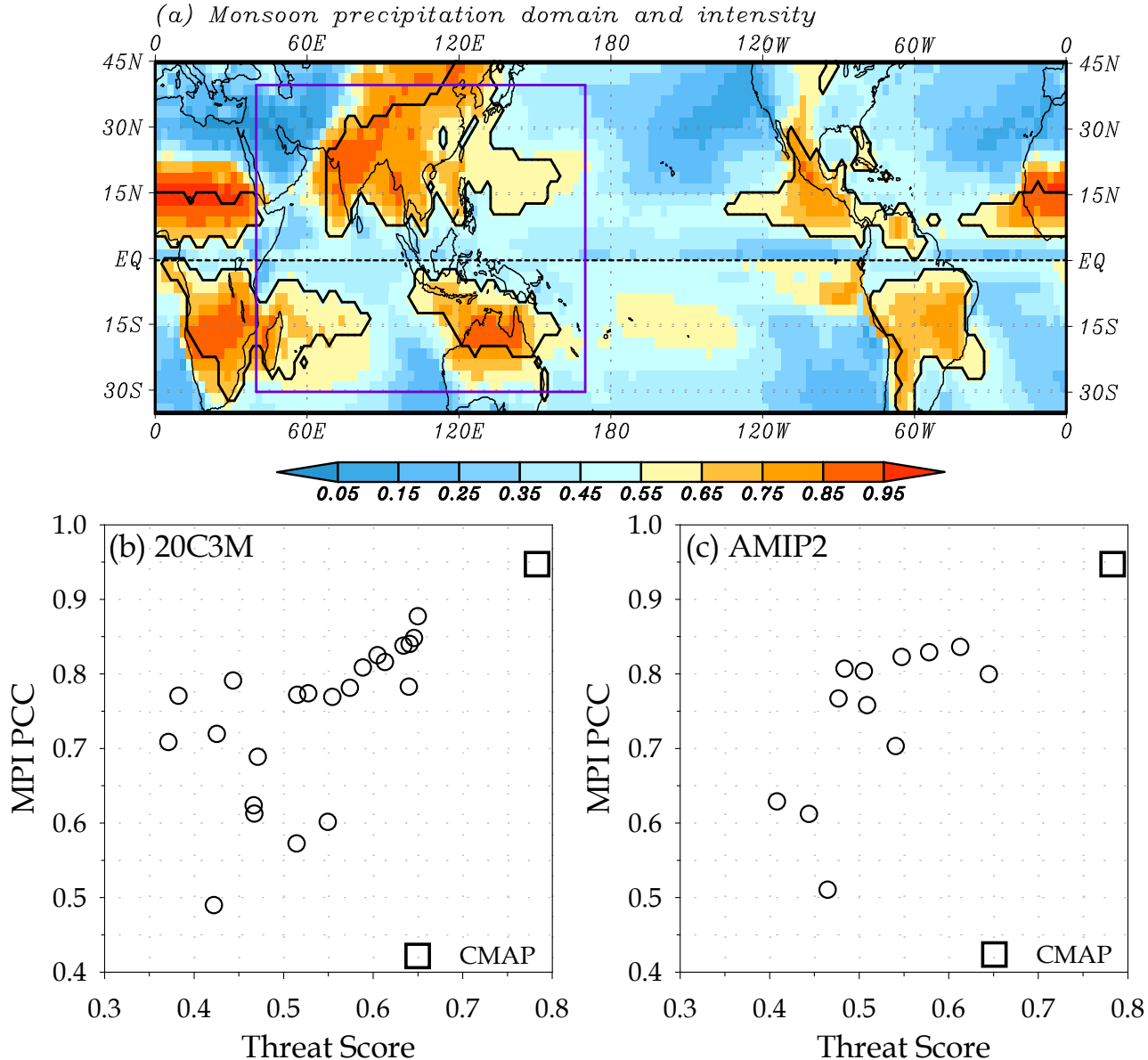


Fig. 4. (a) Monsoon precipitation domain (MPD) and intensity (MPI). The MPD was defined by the local summer minus winter precipitation rate exceeding 2.0 mm day^{-1} and the local summer precipitation exceeding 55% of the annual total. Here the local summer denotes May through September (MJJAS) for NH and November through March (NDJFM) for SH. (b)-(c) pattern correlation coefficients (PCC) for MPI and threat score (TS) for MPD over Asia-Australia monsoon regions [box in Fig. 4(a)] for 20C3M and AMIP2, respectively. **Note that the monsoon domain over the south Indian Ocean is excluded for TS calculation.**