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Supporting Information for

Intraseasonal variability of sea level in the Western North Pacific

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Contents of this file

- Composite means of sea level forced by atmospheric forcing, including Figures S1, S2, S4 and S5.
- Values passing the significance test that are mentioned in the main text, including Figures S3, S6, S7 and S9.
- Variations of probability changes of extreme sea level events for SLA and TSL, including Figures S8, S14-S16.
- Composite means of sea levels and atmospheric forcing, including Figures S10-S13.

Introduction

This file provides the effect of atmospheric forcing on sea level, the results of significance test that are mentioned in the main text, the variations of probability changes of extreme sea level events and composite means of sea levels and atmospheric forcing.

The effect of wind and atmospheric pressure

Composite means of sea level forced by mean sea level pressure (MSLP) over 1993-2017 were estimated by calculating the inverted barometer (IB) effect (Figure S1a, S4a), while the effect of surface wind was extracted after removing the IB effect from the composited DAC.

During boreal winter (December-February), the amplitudes of sea level variability driven by surface wind are large near the coastal areas of the Western North Pacific, which is 2-3cm in the Bohai Sea, 1-2cm in the coasts of China and ~1cm in the Gulf of Thailand (Figure S1b). The amplitudes are about 2cm in these coastal regions in summer (June-August) (Figure S4b).

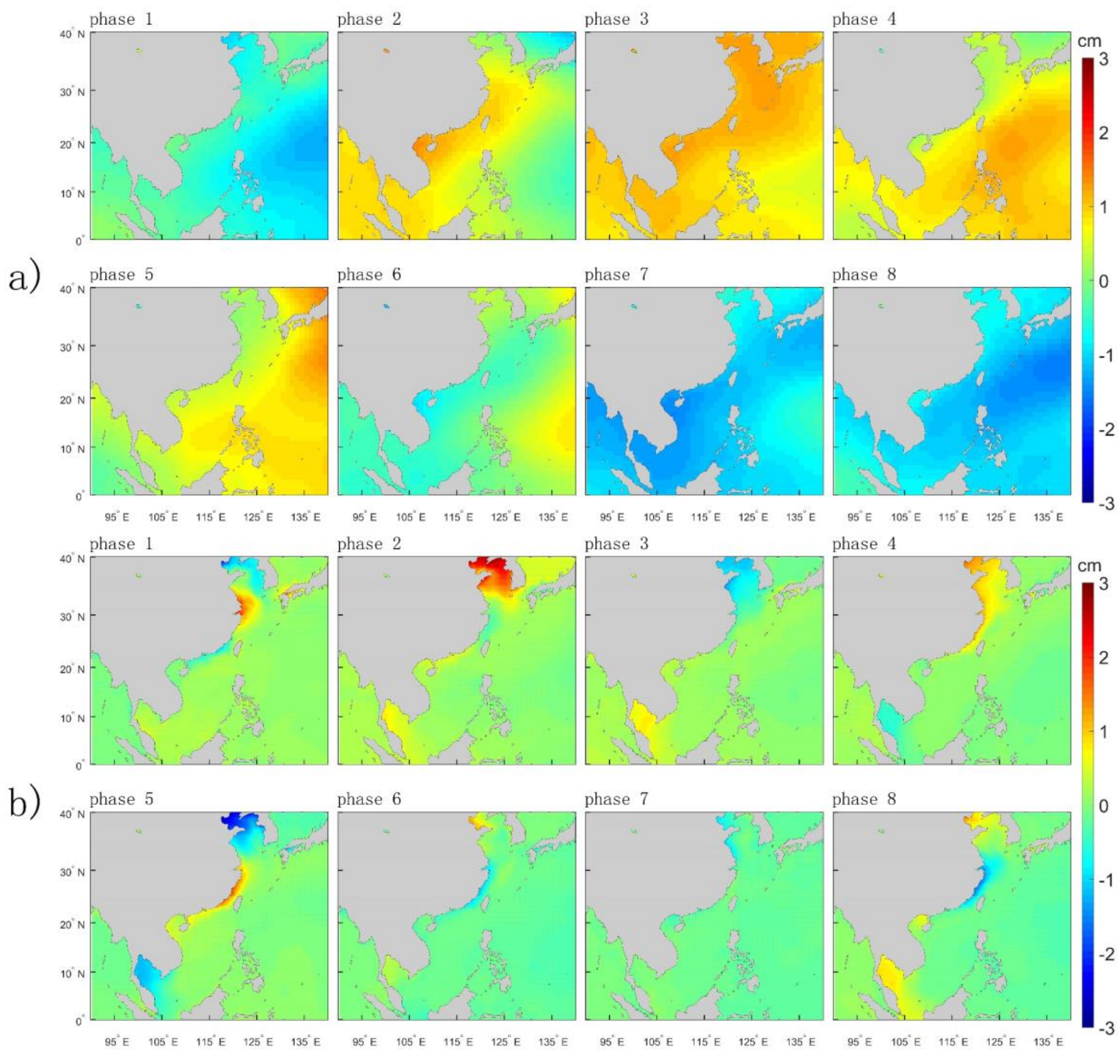

Figure S1. (a-b) Composite means of sea level forced by MSLP and surface wind in winter, respectively.

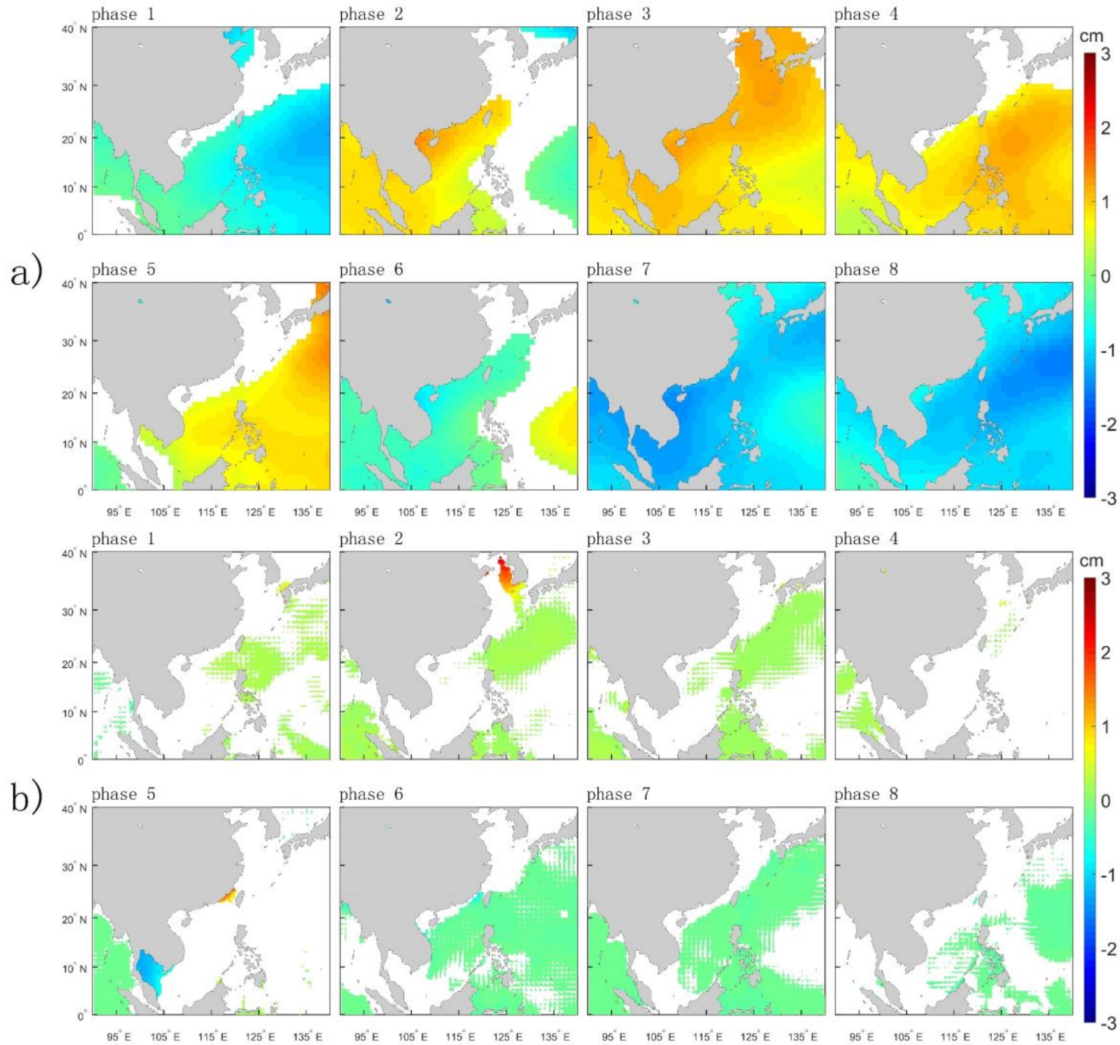

Figure S2. (a-b) Composite means of sea level forced by MSLP and surface wind in winter, respectively. Blank areas indicate the composite means that are not passing the significance test at 95% confidence level.

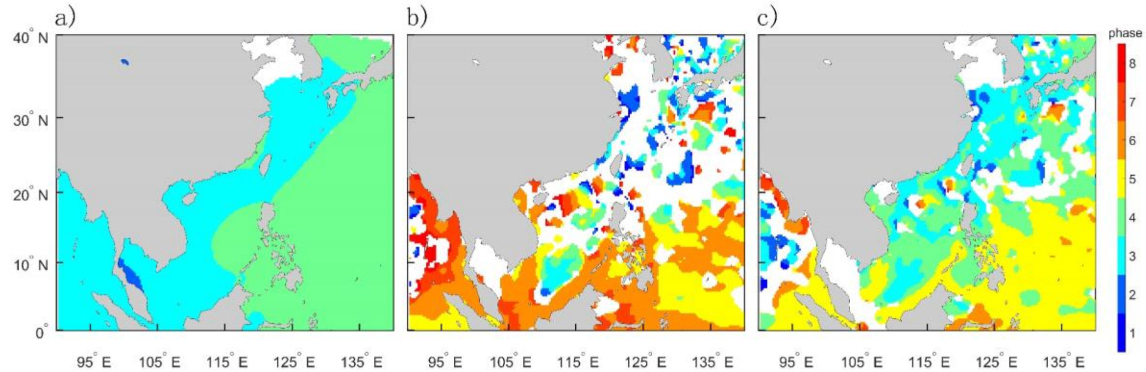

Figure S3. (a-c) Regressed phases of MJO-related signals for DAC, SLA and TSL in winter, respectively. Blank areas indicate the regressed phases that are not passing the significance test at 95% confidence level.

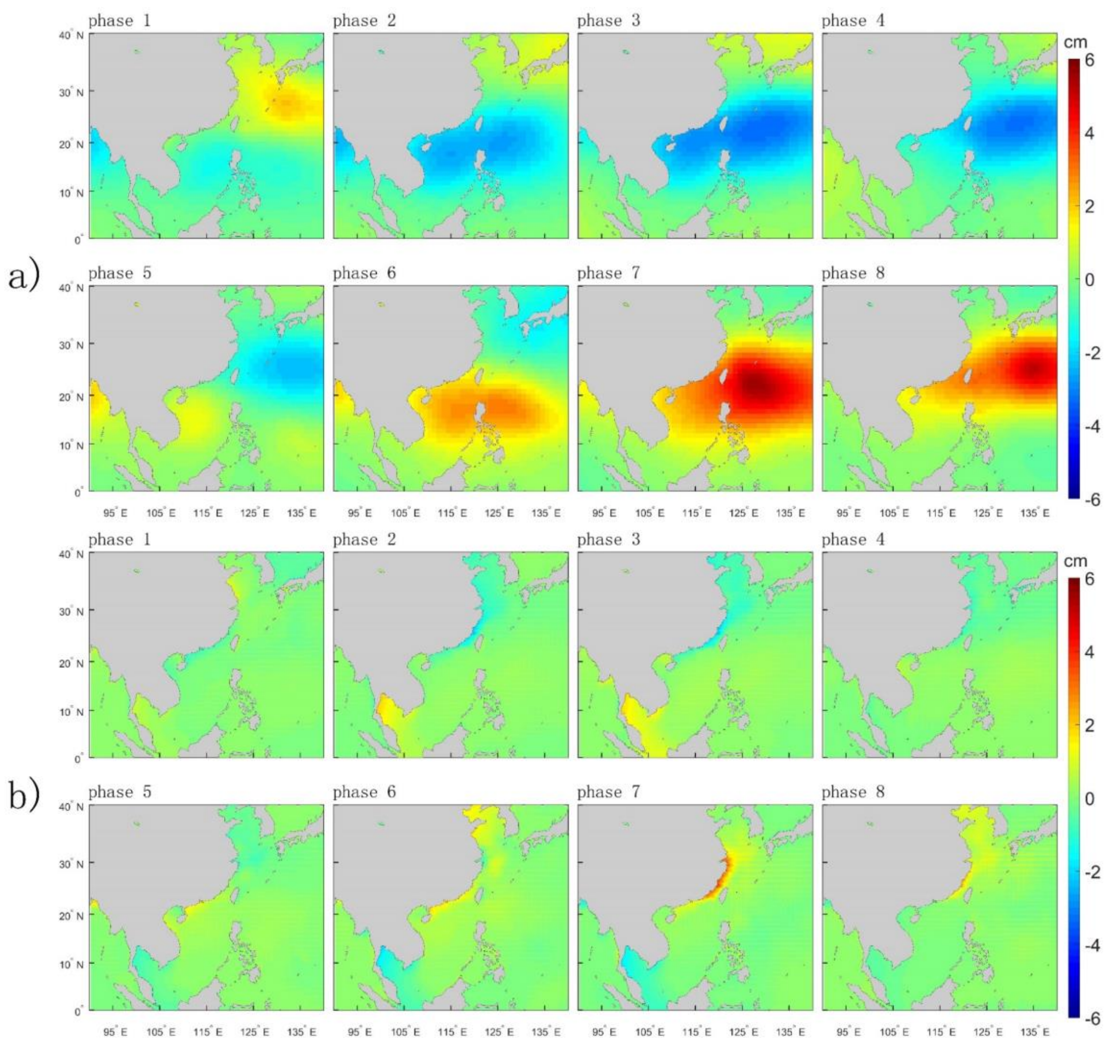

Figure S4. As in Figure S1, but in summer season.

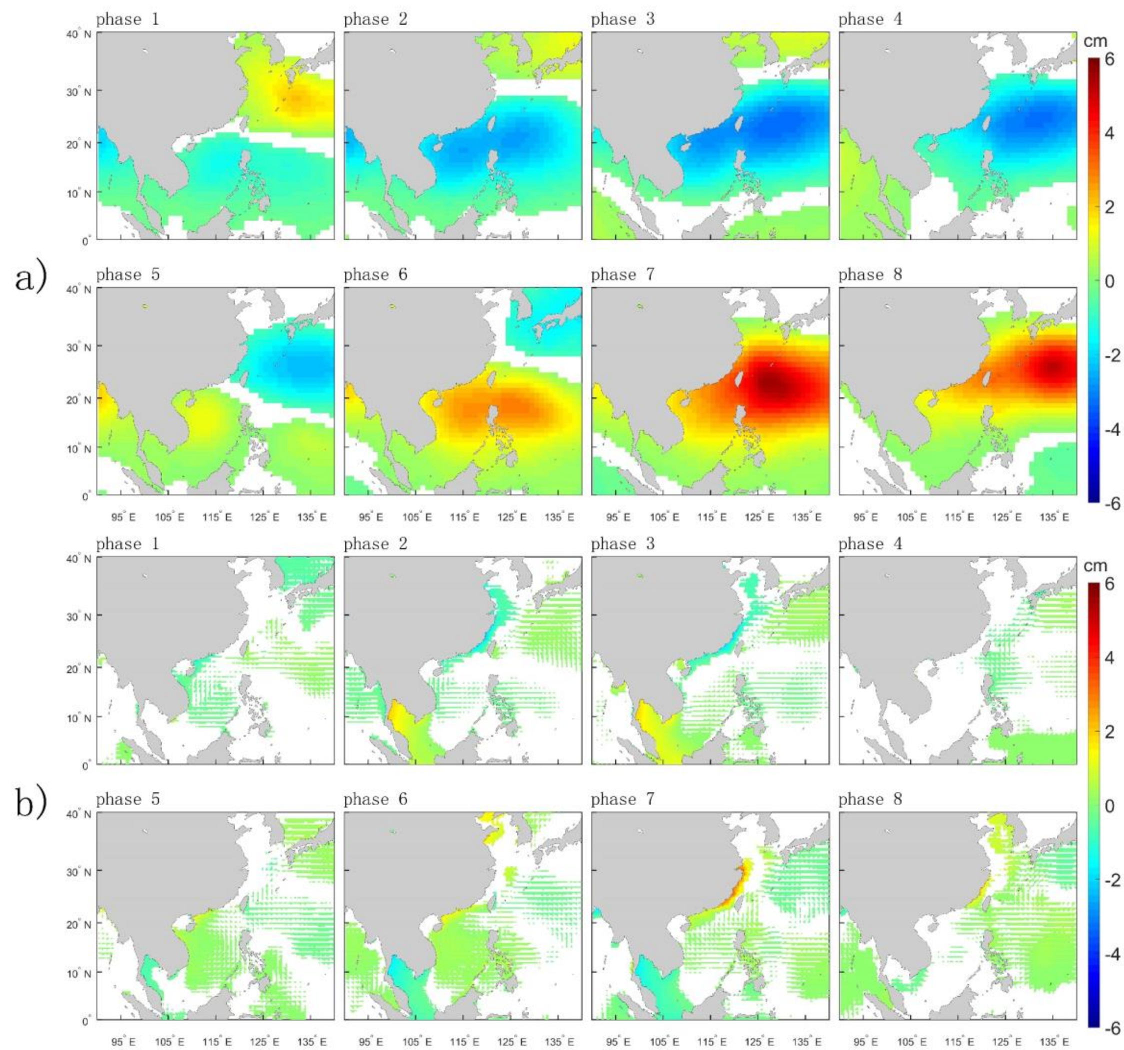

Figure S5. As in Figure S2, but in summer season.

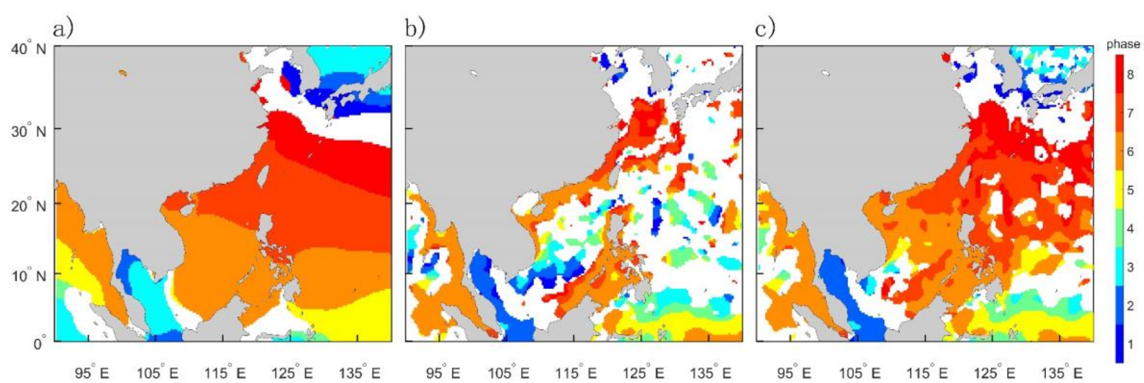

Figure S6. As in Figure S3, but for BSISO and in summer season.

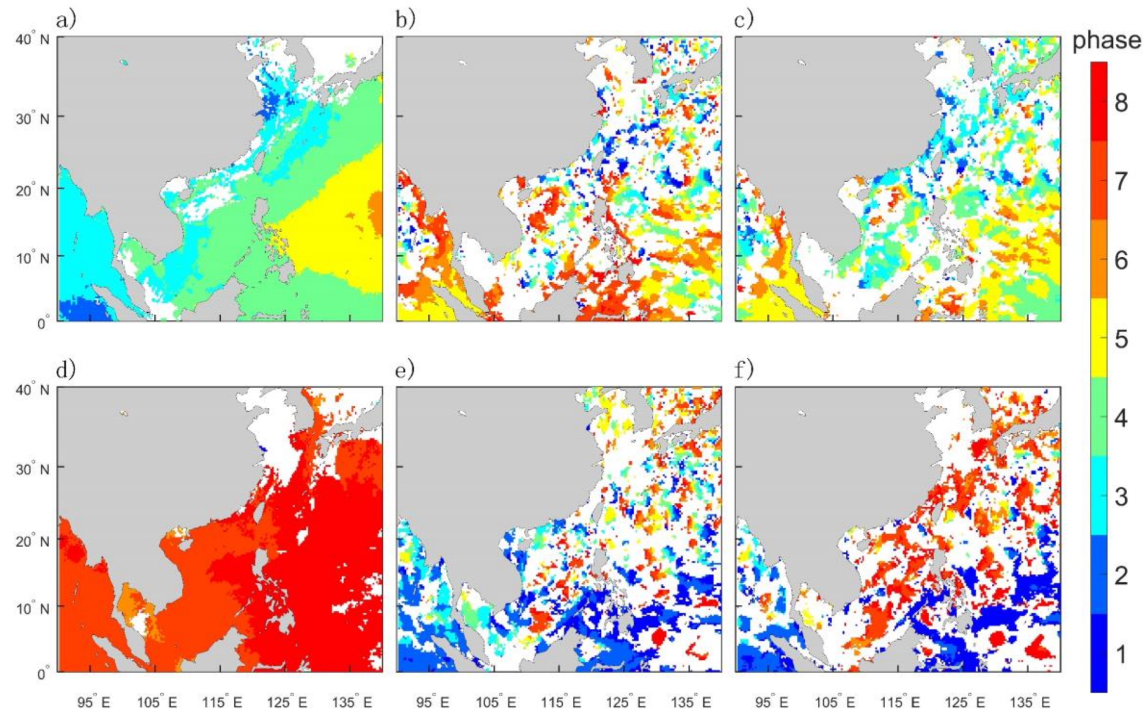

Figure S7. (a-c) Regressed phases of probability changes in ESL high events due to MJO modulations for DAC, SLA and TSL, respectively. (d-f) as in (a-c), but for ESL low events. Blank areas indicate the regressed phases that are not passing the significance test at 95% confidence level.

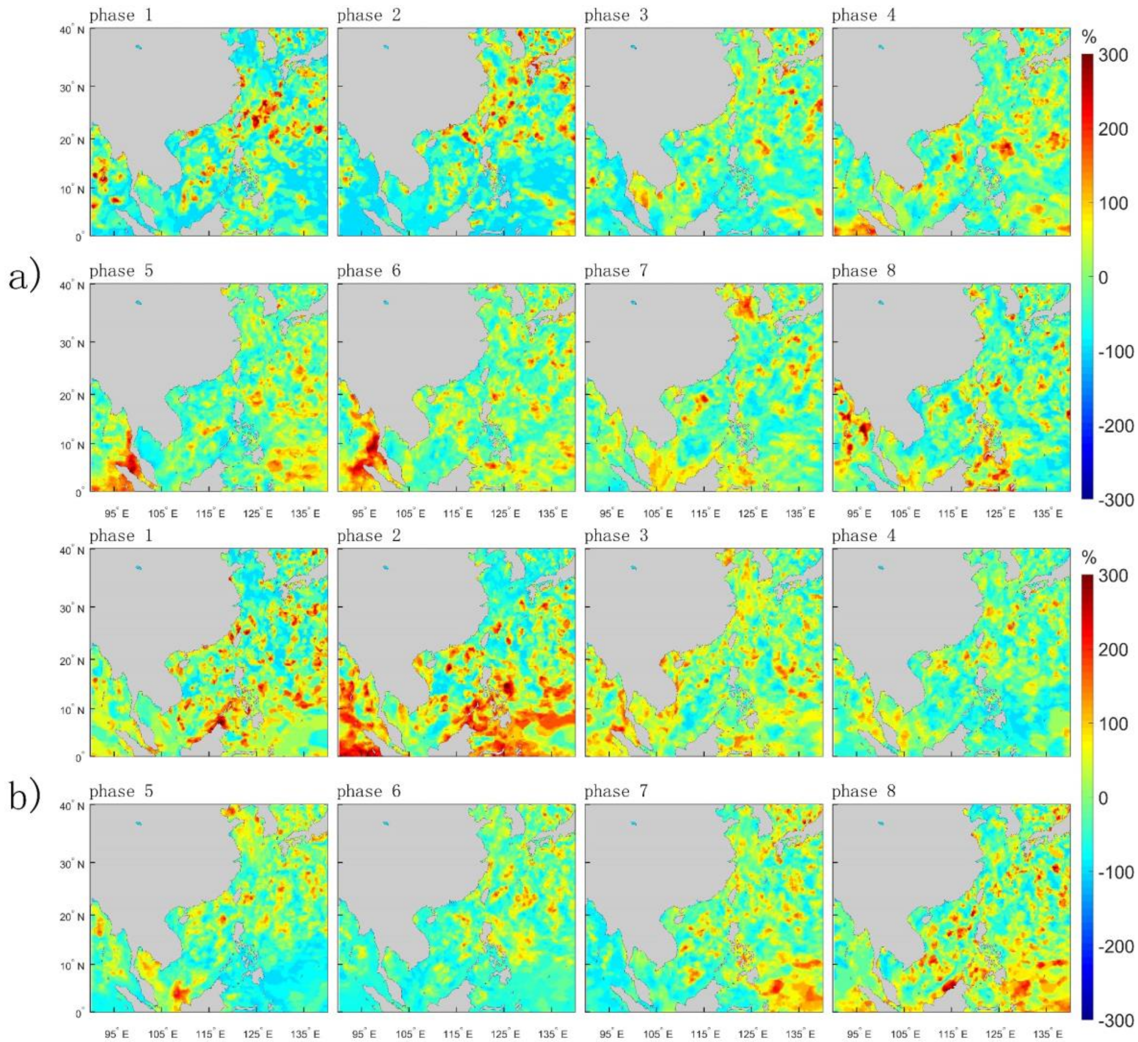

Figure S8. Probability changes of ESL events in MJO phases for SLA: (a) extreme high events (R95); (b) extreme low events (R5).

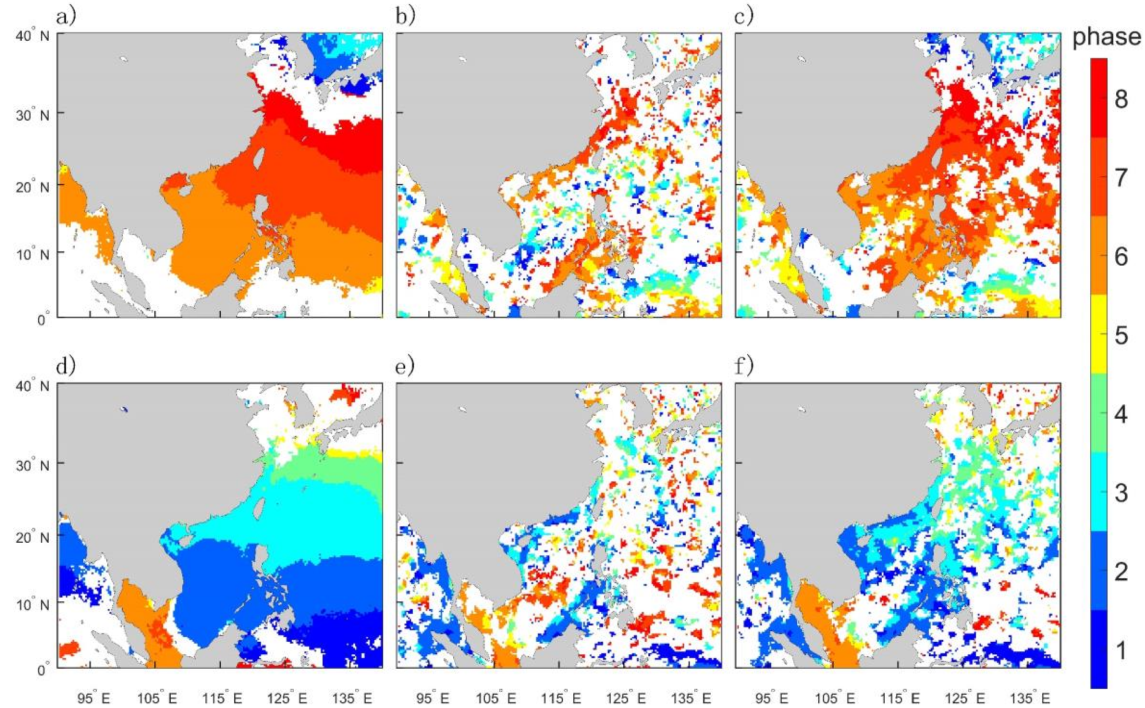

Figure S9. As in Figure S7, but for BSISO and in summer season.