Radiation of multi-source and multi-band internal waves in the northwestern Pacific

Yang Wang[1,2], Zhenhua Xu[1,2], Baoshu Yin[1,2]

[1]*Institute of Oceanology, Chinese Academy of Sciences*

[2]*National Laboratory for Marine Science and Technology (Qingdao)*

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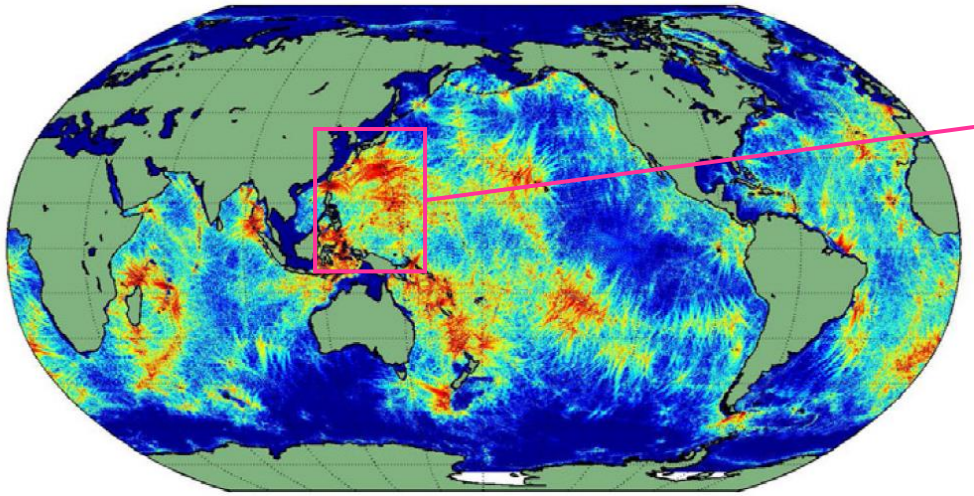
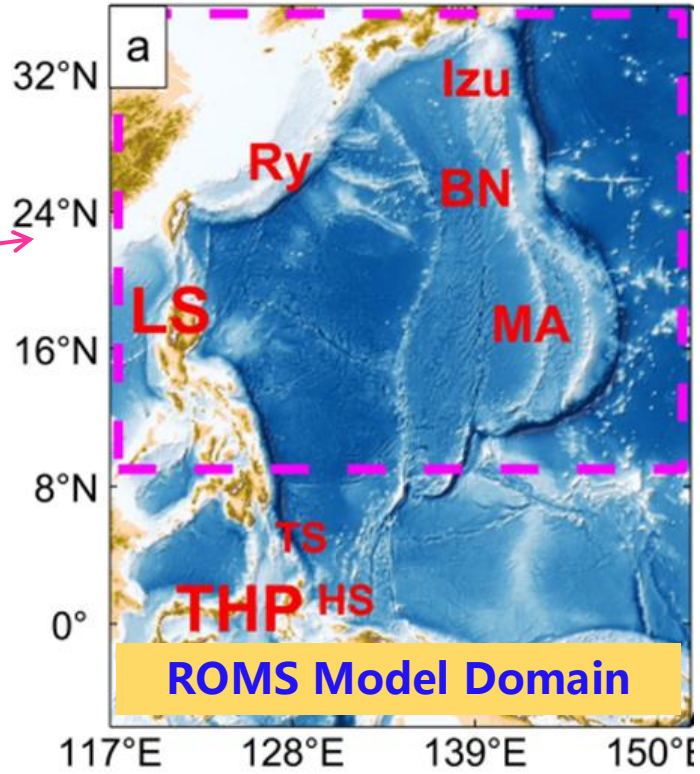
Background

The northwestern Pacific



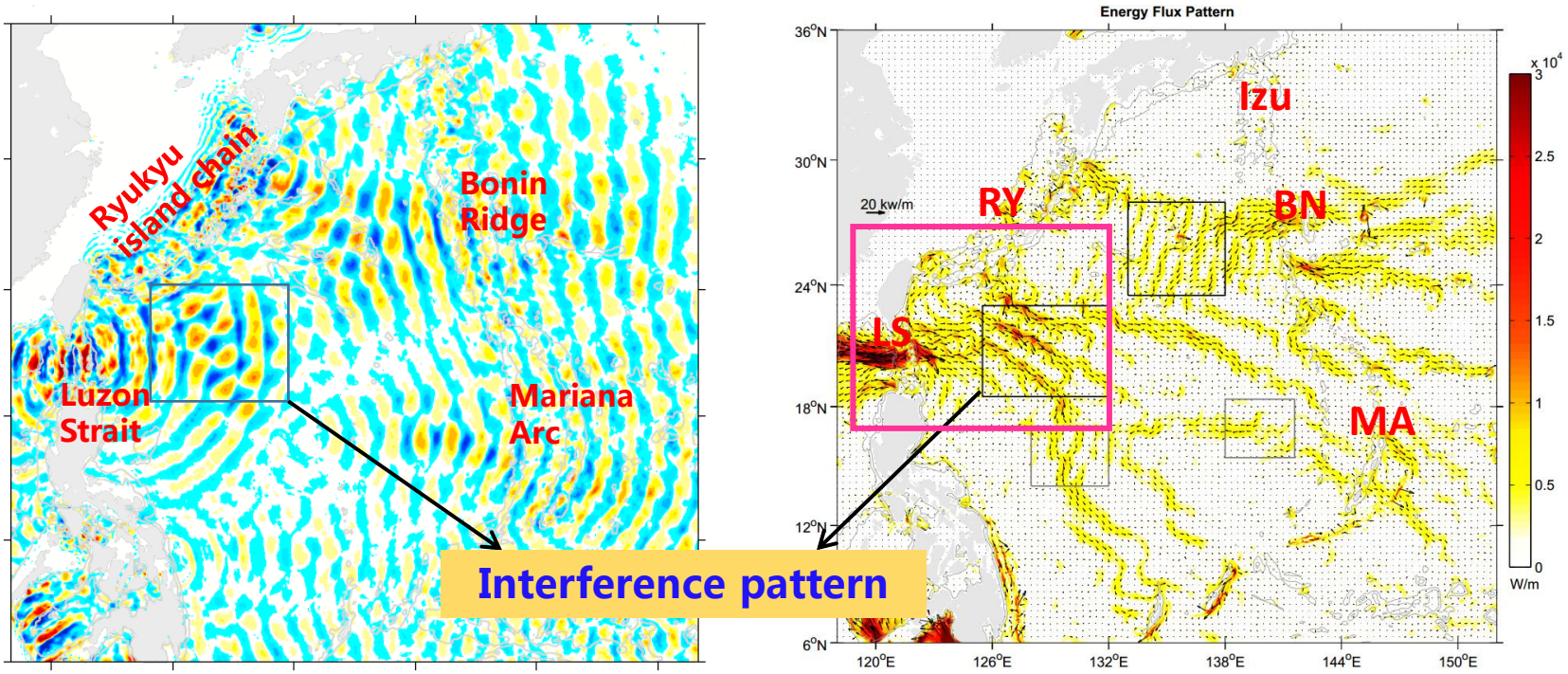
[Muller et al., 2013]



- One of the strongest internal tide generation areas
- Complex topographies feature multiple sources

Key results

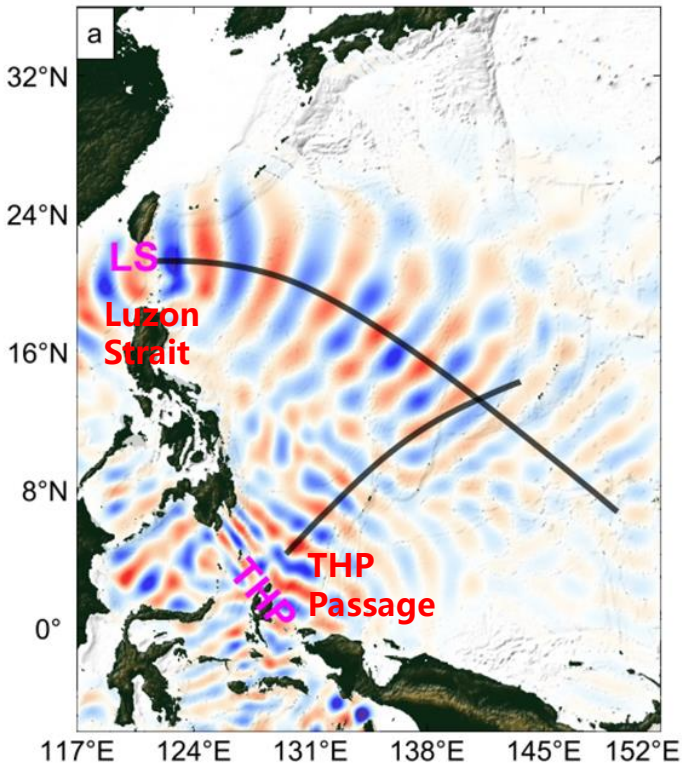
Semidiurnal-band internal tides

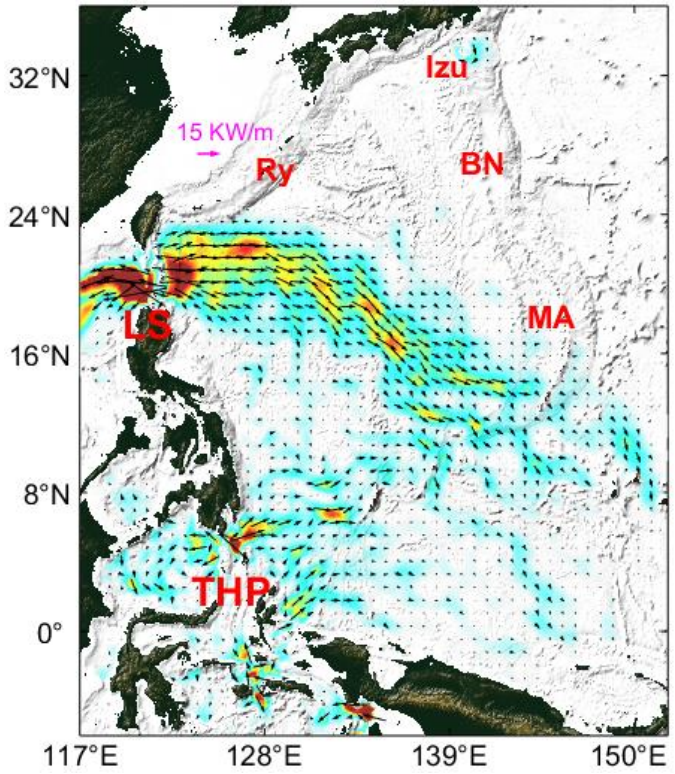


- Long-range radiation & complex interference pattern
- Highly inhomogeneous energy flux field

Key results

Diurnal-band internal tides

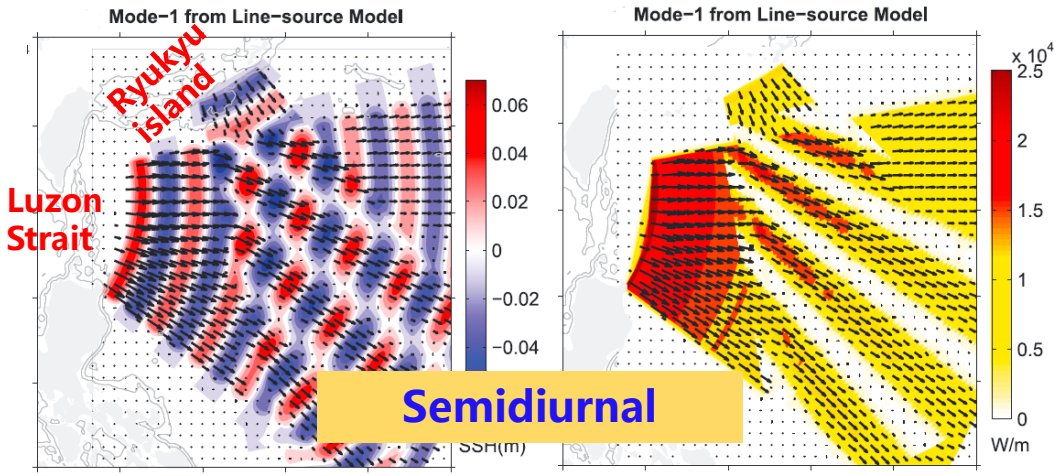




- Luzon Strait and THP passage as dominant sources
- Distinct radiation paths compared to semidiurnal waves
- Evidently bending equatorward due to earth rotation

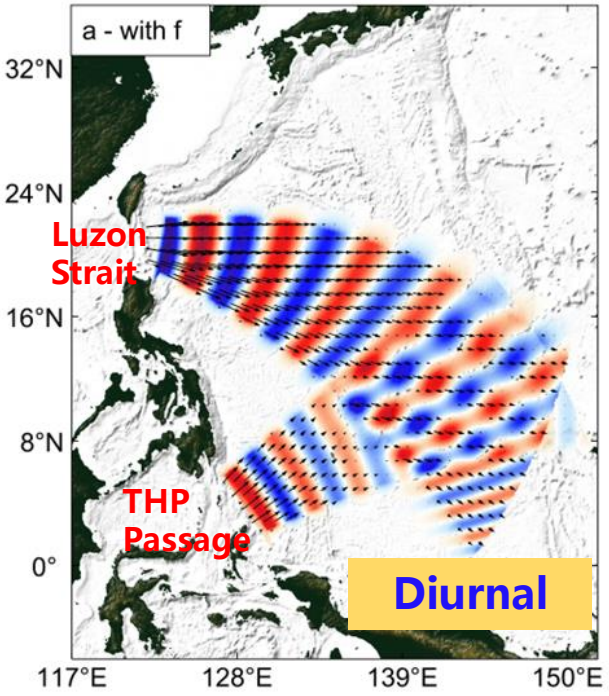
Key results

2-D Line-source model



$$\varsigma(t,r,\theta) = \varsigma_0(\frac{r0}{r})^{1/2}\exp(i\boldsymbol{k}_r \cdot \boldsymbol{r} - i\boldsymbol{w}t + \phi_0)$$

$$\text{for } |\theta - \theta_0| < a_0/2r_0$$



- Radiation paths, equatorward bending and interference patterns of semidiurnal and diurnal internal tides are well reproduced by line-source model


Thanks !