



Contribution ID : 165

Type : **Oral**

## Biologically-associated nitrous oxide accumulation in the euphotic zone

*Thursday, 6 September 2018 16:45 (15)*

The largest uncertainty and inconsistency in global marine N<sub>2</sub>O emission estimate appear in the euphotic zone where physical disturbances prevents N<sub>2</sub>O accumulation if any. Here we presented high vertical resolution N<sub>2</sub>O profiles in the euphotic zone with distinctive peaks near the oxycline in the oligotrophic Western Pacific, where the maximum of Chl-a and nitrite appeared correspondingly. Production term is required to support such N<sub>2</sub>O deviation from the vertical mixing curve. The intimate association between N<sub>2</sub>O excursion and biological parameters suggests that some biological processes, though unclear, must involve. Dual isotope signature of N<sub>2</sub>O around these peaks affirmed in-situ biological N<sub>2</sub>O production. More high-resolution observation and process studies are urgently needed to explore the spatial-temporal distribution of euphotic zone N<sub>2</sub>O production and its controlling mechanisms to fill the knowledge gap. The coupling of the addition of anthropogenic nitrogen and expansion of deoxygenated area in the upper ocean is likely to enhance N<sub>2</sub>O in euphotic layer due to the sensitivity of N<sub>2</sub>O release to deoxygenation. Unlike N<sub>2</sub>O generation in deep ocean, such kind of production in shallow ocean will be more effective in short-term climate feedback according to frequent physical disturbances.

### Position

Professor

### Affiliation

Xiamen University

### Email Address

sjkao@xmu.edu.cn

### Are you a SFB 754 / Future Ocean member?

No

**Primary author(s)** : WAN, Xianhui (State Key Laboratory of Marine Environmental Science, Xiamen University); Dr SHENG, Hua-Xia (xiamen university); DAI, Minhan; Prof. ZHANG, Yao (Xiamen University); KAO, Shuhji (Xiamen University)

**Presenter(s)** : KAO, Shuhji (Xiamen University)

**Session Classification** : 10 Biogeochemical Cycles: Feedbacks and Interactions

**Track Classification** : 10 Biogeochemical Cycles: Feedbacks and Interactions