Driving a Mechanism for El Niño Amplitude Change by a Biogeochemical Process

Jieun WIE[1], Hyun-Ji CHOI[1], Byung-Kwon MOON[1], Ki-Young KIM[2], Johan LEE[3], and Young-Hwa BYUN[3]

[1] *Chonbuk National University, Jeonju, Republic of Korea*
[2] *4D Solution Co., LTD., Seoul, Republic of Korea*
[3] *National Institute of Meteorological Research, Jeju, Republic of Korea*

This study analyzes the effects of biogeochemical processes, including TOPAZ, on the changes in the amplitude of El Niño using the Modular Ocean Model version 5 (MOM5). We designed two experiments to achieve this purpose: – one with biogeochemistry (wBGC) and the other without biogeochemistry (woBGC). Both experiments were also prescribed by observational atmospheric forcing (CORE v2). The wBGC experiment showed enhanced decadal variability of sea surface temperature in the East Pacific, compared with woBGC. This change is thought to be affected by the vertical structural change caused by biogeochemical processes in the tropical mid-Pacific. This change in vertical stability brings an enhanced second vertical baroclinic mode.

Key words: vertical baroclinic mode, MOM5, TOPAZ, biogeochemical process, El Niño

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