

## Current climate-ice sheet studies related to Antarctica and Southern ocean using Earth system models

\*Ayako Abe-Ouchi<sup>1</sup>, Fuyuki SAITO<sup>2</sup>, Masakazu Yoshimori<sup>3</sup>, Akira Oka<sup>1</sup>, Ralf Greve<sup>3</sup>, Keita Uehara<sup>1</sup>, Wing-Le Chan<sup>1</sup>

1. Atmosphere and Ocean Research Institute, The University of Tokyo, 2. JAMSTEC, 3. Hokkaido University

Climate-Antarctica ice sheet and Southern ocean interaction not only affects the local climate but also affect the global climate and ocean. We present some of our current modelling studies and plan using coupled atmosphere and ocean model and ice sheet model. In one of our studies, Eocene experiments were carried out to test the model's ability to reproduce proxy data and to investigate the climate system under high CO<sub>2</sub> concentration. Furthermore, in order to investigate to what extent topographical changes are responsible for the difference between the Eocene and present day climates, we created Eocene-like geometries from the present day topography. We present the individual effects of the Drake Passage, Tasman Gateway, Antarctica Ice Sheet on the climate.

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