기후 분과 [P-039]

Temperature variability associated with climate feedback using an energy balance model

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Equilibrium climate sensitivity (ECS) is one of the crucial indexes implying the Earth's response to the forcing. This could be analyzed based on the change in temperature which is modulated by radiative forcing and climate feedback mechanisms. To better understand the temperature change to the forcing, this study examines the temperature variability in response to the forcing in systems with different feedback mechanisms using a simple energy balance model. The originality of this study is that we adopt the concept of emission temperature (T_e) which is estimated by the outgoing longwave radiation. To do so, we first explore the relationship between surface temperature (T_s) and T_e among state–of–the–art coupled climate models. Then, we investigate how climate systems with different feedback react to the external forcing in SSP scenarios and random internal forcings by assessing the change in simulated temperatures for 100 years. Finally, we could interpret the variability in T_s and also that in T_e with different feedback parameters. This study ultimately aims to explain how climate feedback mechanisms are related to the temperature variability, so that the future study can estimate the ECS by using temperature variability from observational data.

Key words: Climate feedback, Temperature variability, Equilibrium climate sensitivity, Energy balance model