

Seasonal Prediction (Winter 2007) with Icosahedral-Hexagonal Gridpoint Model GME

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Predicting the seasonal change is so important to understand the future's weather and climate condition. There are so many Atmospheric General Circulation Models to simulate the climate change. But, it has the so-called pole problem that exists in conventional latitude-longitude grids. And it is so difficult to simulate regional climate condition due to insufficient temporal/horizontal resolution. So In this study, we have adopted operational global numerical weather prediction model (GME) of German Weather Service (Deutscher Wetterdienst). It is based on uniform icosahedral-hexagonal grid (Majewski et al., 2002). The GME (Global and Regional Model for Europe) gridpoint approach avoids the so-called pole problem. This model can adjust the resolution, so it is possible to simulate weather and climate change of regional scale.

We have performed the long-term simulation to simulate seasonal prediction with GME. So in this study, attempt has been made to perform long-term simulations of GME with mass correction. Mass correction method guarantees the strict conservation of the global mean surface pressure for long-term simulations. So we have performed GME model simulation to predict seasonal change. We have used 40km and 40layers of horizontal/vertical resolution of GME to predict seasonal simulation in East Asia included Korea. We have conducted 2 types of experiments. In one experiment which is considered as control run using SST data for 30 years period of ERA climatology with SST forcing. Another experiment is prediction run using persistent SST anomaly

and SST data for 30 years of ERA climatology from SST forcing. In these 2 types of experiment, we have performed 5 members of ensemble simulation respectively using different initial conditions to reduce the uncertainty of the climate model. In this study, we also have used CRAY X1Eto simulate the climate change at high resolution and have predicted every seasonal simulation. At present, we are performing the simulation of winter season for NDJF 2007 (Nov.-Dec. 2007~Jan.-Feb. 2008).

Among the last simulation of seasonal prediction, we have found that antecedent winter (Dec. 2006~Jan.-Feb. 2007) was warmer and high precipitation especially in February than normal years. While in spring season (MAM 2007), model results does not show any change in surface temperature compared with normal years. As far as concerned to summer simulation (JJA 2007), model simulations higher surface temperature in June compared to normal years, while for precipitation, model simulations high precipitation in June and July. And we have found that this autumn (SON 2007) would be typical weather so it might be warm until middle of October compared to normal years. After middle of October, it may be cold by the influence of the Siberian High. According to the result of GME model, about 9 typhoon will be occurred at Western Pacific during this autumn and two among them move to Korea and Japan in September.

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References

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