1. Introduction
Atmospheric chemical processes have played an increasingly important role in the investigation of global change by its direct and indirect effects on the environmental climate and the radiation balance of Earth system. A new global chemical model, Global Environmental Atmospheric Transport Model (GEATM), has been developed to study atmospheric trace gas and aerosol species over global scale.

2. Model Description
- 1° × 1° horizontal resolution and 20 layers vertical resolution;
- Driven by reanalysis data by NCEP/NCAR or ECMWF or GCMs;
- Uses a mass-conservation module to keep mass conservation;
- Adopt an advanced dust deflation module fully considering various factors.

3 Results Discussion and Validation
In this study, GEATM simulates the space-time variation of SO2, sulfate, Black carbon, organic carbon, sea salt (2 modes) and dust aerosol (4 modes) of 2003-12 through 2004-11.

4. Conclusions
- GEATM has been compared with several accumulated observations over the world. The comparison of observed and simulated data shows GEATM can capture the major characteristics of local air pollution, and the comparison of the AOD acquired MOD08_M3 and GEATM also indicates that this model has a strong ability to depict the global distribution of aerosol species.
- The analysis of the characters of global distributions of sulfide and dust implicates that the distribution of chemical species mainly lies on the source and meteorological field.
- A series of intercontinental transport channels spreading along those strong wind belts at middle and low latitude are successfully reproduced by GEATM.

GEATM can not only simulate the global distribution of aerosols, but also can simulate the evolution of trace gases such as ozone, CO2.