

## Energetics

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The purpose of AMIP project has close connection to that of MECCA project. Therefore, many of AMIP investigators are also MECCA investigators. In this short report of the preliminary results, a comparison of the energy spectra in the zonal wavenumber domain is presented for NCAR/CCM2 and observation by the ECMWF. The analysis method is based on the standard spectral energetics by Saltzman. The energetics characteristics for the ECMWF global analysis are examined for consecutive 5 years from 1986 to 1990 to find the average energy levels as well as the interannual variability in the observed atmosphere. The objective of the present energetics analysis is to understand how the energy levels and energy interactions depend on the horizontal resolution of various climate models. For this reason, the energetics characteristics of the NCAR/CCM2 are compared for the resolutions of R15, T42, T63, and T106. Since the AMIP models have diversified

model resolutions, a comprehensive comparison of the same model outputs for different horizontal resolution would offer a meaningful milestone for the diagnostic analyses.

Figure 14 illustrates kinetic and available potential energy spectra for various resolutions of the CCM2 during northern winter. Plotted also in the same figure is the 5 year mean energy level and the standard deviation for the ECMWF analyses. The characteristic energy spectra at the truncation wavenumber is clearly detectable. It is shown that the energy spectra for various model resolutions are within the deviation of the ECMWF analyses. The spectral energetics results are available for the complete energetics terms, such as baroclinic conversion, zonal-wave interactions, wave-wave interactions, generation, and dissipation.

As the AMIP diagnostic subproject, we plan to extend the present spectral energetics analysis for other AMIP models, including those of JMA, MRI, NMC and ECMWF.

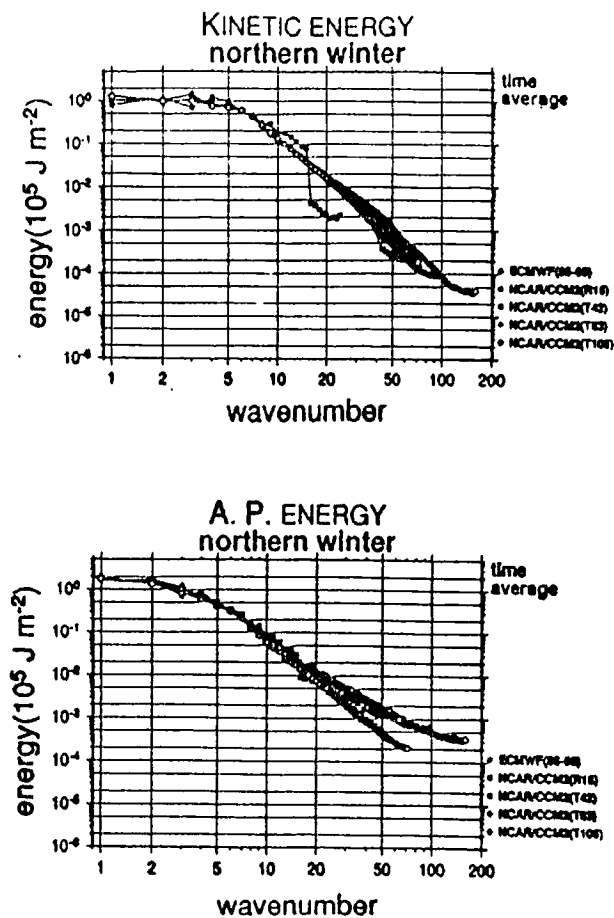


Fig. 14. The wavenumber spectra of kinetic energy and available potential energy as simulated by the NCAR CCM2 AMIP model at different resolutions in comparison with ECMWF analyses.