

3-D Structure of Baiu Front around Japan Simulated by Ultra High Resolution Atmospheric General Circulation Model on the Earth Simulator

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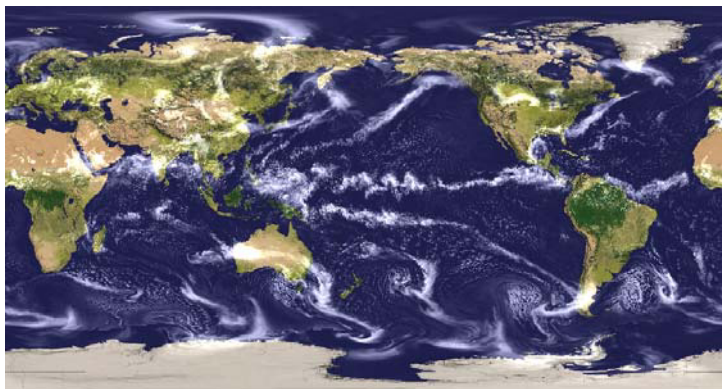


Fig. 1. 2-D distribution of precipitation

Baiu/Meiyu is a rainy season in East Asia that lasts for about a month in early summer. A simulation performed on the Earth Simulator with the global atmospheric model (AFES) at ultra high resolution of T1279L96 (about 10km mesh at the equator), shows typical features of Baiu front. Distribution of the global precipitation shows rainfall along the Baiu front extended from China towards Japan (Fig. 1).

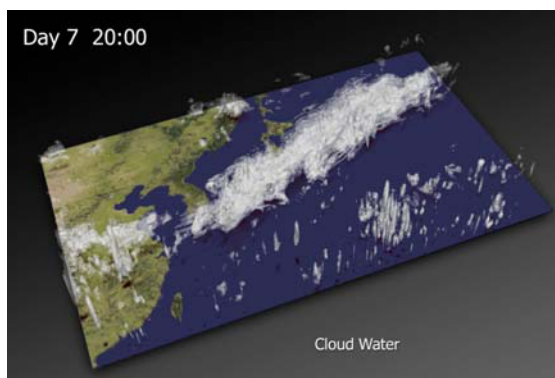


Fig. 2. 3-D distribution of cloud water in Japan region

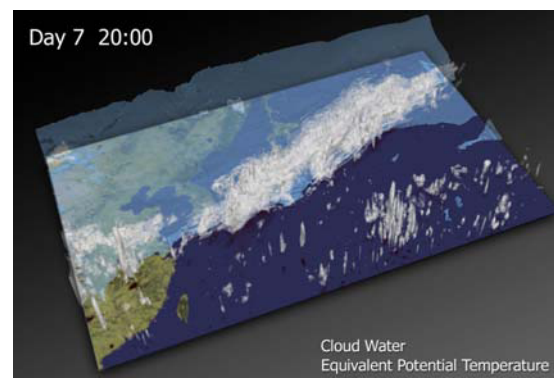


Fig. 3. An isosurface of equivalent potential temperature and cloud water

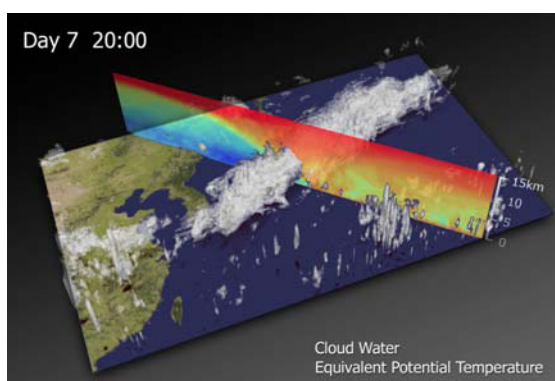


Fig. 4. A vertical section of equivalent potential temperature and cloud water

Figs. 2, 3 and 4 show 3-dimensional structure of the simulated Baiu frontal zone over the Japanese Honshu Island. Strong precipitation represented by black shadow coincides with the distribution of cloud water closely linked to rainfall (Fig. 2). Condensation occurs along the Baiu frontal zone. One of isosurfaces of the equivalent potential temperature represents a boundary between warm-moist and cold-dry air along the Baiu frontal zone (Fig. 3). A vertical cross-section of the equivalent potential temperature clearly shows that the Baiu front is simulated to be very sharp but tilting north-westward to form a "zone" (Fig. 4).