Global Sea Surface Temperature Distribution

Fig. 1 OCTS Global Sea Surface Temperature Map (Monthly Binned: 1 December 1996 - 29 December 1996) ver.4.1

Fig. 2 OCTS Global Sea Surface Temperature Map (Monthly Binned: 7 May 1997 - 31 May 1997) ver.4.1
Sea Surface Temperature (SST) influences the global weather and climate. SST is also affected by the atmosphere and changes spatially and temporally. To accurately observe SSTs in the global oceans is important not only for meteorological and oceanographic research but also for operational duties, such as weather forecasting and fisheries management. OCTS is the first Japanese satellite sensor to observe global SSTs. Because of sensor swaths and problems on data recording, several Japanese satellite sensors could not observe SST distributions in the global ocean. The large-capacity data recorder onboard ADEOS enabled us to observe the global SSTs with 700 m spatial resolution first time in the history.

Figure 1 shows the monthly mean global SSTs in December 1996. The zonal structure of SST distribution, which is high in the equatorial region and decrease with latitudes, is clearly seen. The SSTs change largely in the zonal region between the latitudes of 30 to 40 degrees in both hemispheres, where the warm currents (subtropical gyres) and the cold currents (subarctic gyres) meet. Many eddies are generated in this transition zone, and a large amount of heat energy is transported to the north in the oceans. In the equatorial region, SSTs cooler than the surrounding areas are distributed forming a east-west tongue off the coast of Peru. These cooler SSTs are associated with the upwelling of cold deep water caused by the equatorial wind system (trade winds). When El Niño events occur in this region, the wind system changes and the upwelling ceases. The 97/98 El Nino, believed to be the largest of this century, started and evolved in the first half of 1997 when the OCTS was functioning. Figure 2 shows the monthly mean global SSTs in May 1997. The cold tongue in the equatorial region off the Peru coast disappeared, and SSTs in this region are almost the same as the SSTs in the surrounding areas.