Transport Stream Quality Monitoring System
- A monitoring system for the digital broadcasting era -

NHK STRL

There is a growing demand for automatic monitoring in digital broadcasting systems. The increasing complexity of broadcasting systems and the spread of multi-channel broadcasting will increase the areas that have to be monitored.

Quality management is a complicated issue for digital broadcasting, because monitoring technique for conventional analog broadcasting does not always perform well. Test signal measurement or off-line monitoring using particular signals often gives different results than for actual signals. The degree of coding degradation varies with the criticality of the source video and the degradation tends to occur locally in a spatial and temporal domain. It is often hard to discriminate the causes of artifacts, such as coding, transmission errors, or system failures.

An analyzing method using coding bitstreams is very suitable for monitoring. By analyzing the coding parameters taken out of the bitstream, we can estimate the picture quality of the decoded pictures. By checking the syntax, we can examine the transmission errors.

With the aim of monitoring the status of digital broadcasting equipment and its network, NHK developed an TS quality monitoring system that analyzes MPEG-2 transport stream (TS) signals in real-time, monitors video quality, and detects failures. The new TS quality monitoring system is capable of determining transmission errors and system failures through analysis of coding parameters, in addition to making a video quality evaluation, and has the following characteristics:

(1) Measurement of HDTV picture quality in the MPEG-2 TS by using a new picture quality estimation algorithm.
(2) Encoder operation status confirmation through visualization of quantization parameters and motion vector information.
(3) Automatic detection of transmission errors and system failures.

A wide range of system applications are expected, ranging from a material network and transmission master in a broadcasting station, to broadcast-wave monitoring and quality monitoring for MPEG-2 video distribution services belonging to cable TV and telecommunications companies. KDDI Media Will Corporation has manufactured a product that employs the TS quality monitoring system.
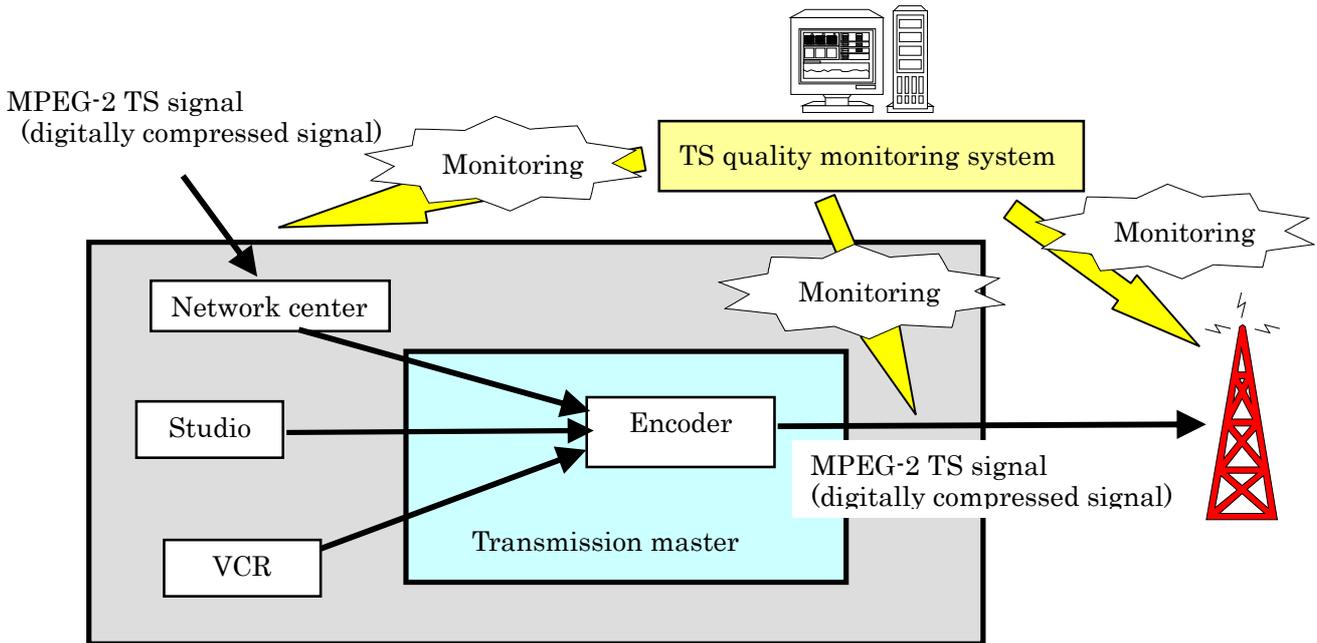
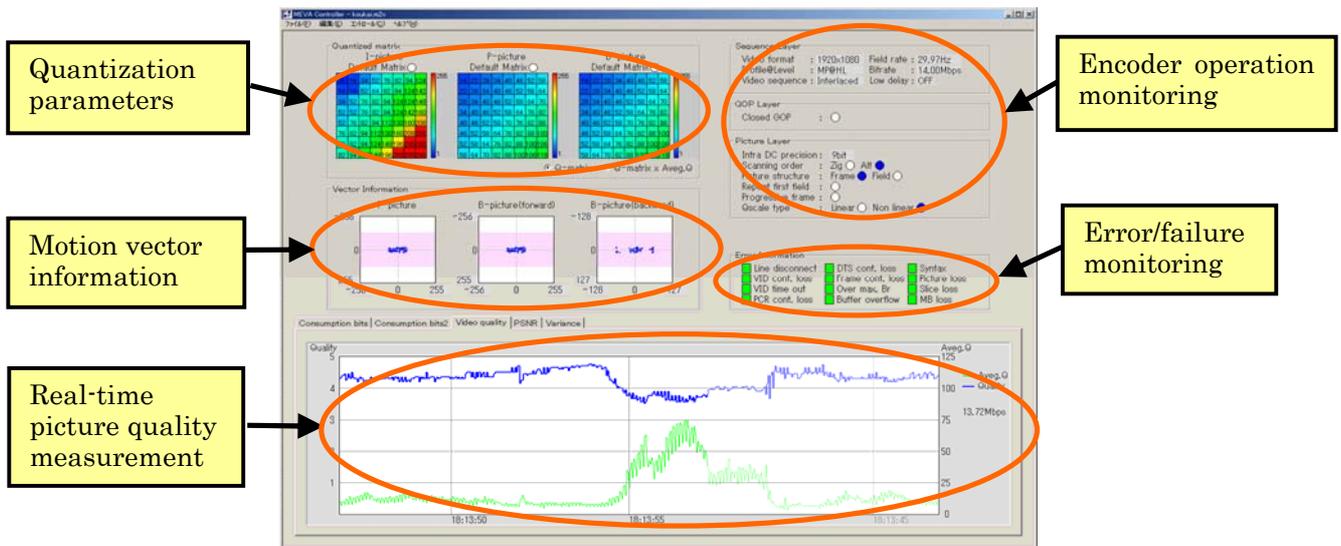Figure 1　Application example of TS quality monitoring system

Figure 2　Example of monitoring screen

Figure 3　Product of TS quality monitoring system