

QUESTION ITU-R 44-3/6

Objective picture quality parameters and associated measurement and monitoring methods for digital television images

(1990-1993-1996-1997-2002-2003-2005-2006)

The ITU Radiocommunication Assembly,

considering

- a) that considerable progress in digital television standards has been achieved;
- b) that the Radiocommunication Study Group is responsible for setting the overall quality performance of broadcasting chains;
- c) that for television systems, ranging from low-definition systems¹ through SDTV to HDTV and including specific applications such as multiprogramming, it is essential to identify objective picture quality parameters as well as associated performance measurement and monitoring methods, for the studio environment and in broadcasting;
- d) that display technology, including fixed pixel displays, have digital pre-processing which may introduce unexpected artifacts, such as pixel rescaling, contrast ratio compensation, colorimetry correction, etc.;
- e) that it would be an advantage if measurement methods used for such tasks were unified for HDTV, SDTV and low-definition systems;
- f) that impairments to television pictures can be shown to correlate with measurable features of the signals;
- g) that overall picture quality is related to the combination of all impairments;
- h) that developments in the statistical characterization of television images and modelling of the human visual system may lead to the replacement of subjective assessment by objective measurement in certain applications;
- j) that in the case of digital TV it is necessary in particular to assess the performance of bit rate reduction methods both in terms of subjective and objective parameters;
- k) that the measurement of performance requires agreed standard test materials and methods based on moving and static images;

¹ These are those systems having a lower resolution than SDTV, such as those now used for mobile or handheld reception of broadcast programmes.

- l) that the scrambling process used in conditional access broadcasting may require special steps to be taken where bit-rate reduction is to be employed; and
- m) that continuous evaluation and monitoring of quality (including dynamic resolution) is needed,

decides that the following Question should be studied

- 1** What are the objective performance parameters for each application identified, and for each digital TV format?
- 2** What are the necessary test materials and test signals required for the objective picture quality measurement of these applications and for each digital TV format?
- 3** What methods should be used for measuring and monitoring the parameters defined in §§ 1 and 2 to cover all motion artifacts and impairments including those introduced by the display pre-processor?
- 4** What characteristics should be recommended for a cost-effective quality meter which gives a direct displayed indication of picture quality?
- 5** What steps are necessary to coordinate the scrambling and bit-rate reduction processes so as to maintain the desired subjective and objective quality?
- 6** What characteristics should be recommended for a high quality electronic evaluation method for testing the quality of digital television pictures?

further decides

- 1** that the results of the above studies should be included in (a) Report(s) and/or (a) Recommendation(s);
- 2** that the above studies should be completed by 2007.

Category: S3