Since structural distortion is tightly linked with edge degradation, we propose a reduced reference (RR) quality metric which compares edge information between the distorted image and the original one. We propose to apply Sobel filtering locally, only for some blocks of the entire image, after subsampling the images.

Images are divided in sub-windows, as shown in Figure 3. For instance, if images have size 512 x 768 we could subsample of a factor of 2 and consider 16 x 16 macroblocks of size 16 x 24 each, or we can subsample of a factor 1.5 and consider 18 x 16 macroblocks with size 19 x 32 each. The example in Figure 3 reports the second option. The block size is chosen such that it is sufficiently large to account for vertical and/or horizontal activities within each block, but small enough to reduce complexity and the size of side information. In addition, sub-windows are non coincident with macroblocks, to enable a better detection of DCT artifacts in the case of DCT compressed images and video.

In order to reduce the overhead associated with the transmission of side information, only 12 blocks are selected to represent the different areas of the images. The block pattern utilized for our tests is chosen after several investigations based on visual attention (VA). Various experiments have been proposed in the literature for VA modeling and salient region identification, aiming at the detection of salient regions in an image. Models on visual attention are often developed and validated by visual fixation patterns through eye tracking experiments [16] [17]. In [18] a framework is proposed in order to extend existing image quality metrics with a simple VA model. A subjective ROI (Region Of Interest) experiment was performed, with 7 images, in which the viewers’ task was to select within each image the region that drew most of their attention. For simplicity, in this experiment only rectangular-shaped ROIs were allowed. Considering the obtained ROI as a random value, it is possible to calculate the mean value and the standard deviation. It was observed that the ROI’s center coordinates are around the image center for most of the images, and the mean of the ROI dimensions are very similar in both x and y directions. This confirms that the salient region, which include the most important informative content of the image, is often placed in the center of the picture.

Following these guidelines we have chosen the block pattern as a subset of the ROI with a central symmetry, minimizing the number of blocks to reduce