

THE COMBINED CINE AND TV APPROACH TO ANALYSIS OF MOTION IN BIOMECHANICS

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The biomechanical analysis of sport motion requires precise data "space vs.time" of the body elements being under inspection. The well-known and everywhere adopted method of localisation is the photographic or motion picture one.

Nevertheless, the practical use of this method is limited by the processing (developing, fixing, etc) of the exposed film, and a high price of the photographic silver salt process. The image on film is permanent and cannot be used for a new process of taking pictures.

The TV recording on a magnetic tape has many advantages over the photographic one, including the possibility of erasing of the recorded tape for a new use. The TV images of still and moving objects are very different by sharpness, i.e. the localisation resolution by TV recorded picture of a TV moving object is very poor. The observer in the process of perception of a TV image does not notice it. This loss of exact localisation on a still frame limits the appreciations of TV recorded images for measurements, i.e. the combined use of kinematography and TV methods.

The authors have studied the probable sources of the localisation errors in a recorded moving object. The major part of the errors is due to the unlimited exposure of the electronic camera tube. To eliminate this I.V. Istomin has proposed a shutter (Soviet Union Patent, 25.12.1981, Pat. No. 1035622-A) which allows to get sharp edge pictures of a moving body. Thus a precision data picture is possible. The combined use of motion picture and TV technology makes it possible to transcribe long time period motion on a magnetic media and then, after analysis made by the coach and proper selection of items, to film the desired scenes of the movements from the monitor screen, for further analysis of making kinograms. This method permits to combine use of cine and TV methods taking the best from each one.