

## Information multiplexing with theta modulation technique

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### Abstrak

Multiplexing is meant to record a number of different information in a piece of film. The multiplexing is conducted by giving a code to each information prior to the recording.

In this research the multiplexing is done with the theta modulation technique, i.e. using a rotated grating so that each information is coded by a certain angular direction of the spatial frequency of the grating. To recover the original information, the demultiplexing is done by filtering the Fourier transform of the multiplexed recording. A spatial filter in the form of a properly oriented slit is located at the Fourier plane to transmit the diffraction pattern of a single information.

The limitations to the number of information which could be recorded are the information extent within each object and the linearity characteristics of the film used.

The experiment has been conducted using a diffraction grating with a spatial frequency of 14.2 lp/mm. For an exposure speed of 1/1000 second for each information and a grating rotation angle of 1.50, a number of eleven (11) information can be multiplexed. For an exposure speed of 1/2000 second, and a grating rotation angle of 50, eighteen (18) information can be multiplexed.