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## Performance improvement in fiber optic communication with optical phase conjugation

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Optical phase conjugation has been used to remove the errors in an optical fiber communication system. Such a system requires an optical beam to pass through the same optical fiber again for obtaining error free communication, which is actually not realizable in practice and further more since the signal is passed through fiber twice the total attenuation is doubled in such a system if realized. This paper proposes a realizable communication system using photorefractive crystal with electrodes for modulating the phase conjugated beam, which acts as a Phase Conjugate Mirror and Modulator (PCMM). In this system the Laser beam (from a beacon) falling on the photo refractive crystal through the fiber is modulated with the input signal, and a modulated phase conjugate beam is produced by the photorefractive crystal. All the errors introduced by the media in the laser beam are removed by the phase conjugate beam in the return path. The error free signal is received at the desired location with the help of a beam splitter. The proposed arrangement thus produces a chromatic dispersion, Kerr effect and self phase modulation free optical fiber communication system. The Blue-Green laser (having low attenuation for water) communication is commonly used for high data rate under water communication. This system would have enormous potential in shore to submarine and satellite to submarine under water communication systems.

### Biography

S C Jain, after completing MSc (Physics), joined Defence Electronics Applications Laboratory, DRDO, in 1969. He has worked in various projects such as Troposcatter Communication Systems, Multispectral Scanner, Image Processing using Phase Conjugation Techniques, Correlator using Joint Transform Correlation techniques and Image Processing Software development. During 1985-86 he was awarded Indo US Fellowship. He has been a Visiting Scholar to University of Alabama, USA. He completed his PhD in 1989. He has more than 95 publications in the journals of repute and conferences. He has been Group Director, Image Analysis Centre. He has guided a thesis on Automatic Registration technique and guiding research work in MMW imaging.

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