CCIT Report No. 326

Capacity and Decoding Rules for the Poisson Arbitrarily Varying Channel

Shraga I. Bross and Shlomo Shamai (Shitz)

ABSTRACT

The single-user and two-user (multiple-access) Poisson arbitrarily varying channel with input and state (peak and average-power) constraints, but unlimited in bandwidth, is considered. For both cases the deterministic and random code capacity with the average probability of error criterion is obtained. In the single-user case Wyner's [19] decoder attains the deterministic-code capacity whereas for the two-user case a "minimum distance" decoder that belongs to the class of β-decoders [4] is shown to attain the deterministic-code capacity region as claimed.

Index Terms – Arbitrarily varying channel, Poisson channels, capacity, optical CDMA.