

## ABSTRACT

*The development of an interactive service applications via Hybrid Fiber Coax (HFC), like telephony, internet access, and high speed data services need two way transmission. Bandwidth between 5-42 MHz is allocated for upstream signal of the interactive services. The biggest problem in HFC network is high noise level on the upstream spectrum frequency such as thermal noise, narrowband ingress noise, impulse noise and micro reflections. Micro reflections cause multi paths phenomena on coaxial transmission lines.*

*The Simulation process of a HFC upstream physically layer design with DOCSIS 2.0 specifications. The design consists of RC coding block, interleaver block, scrambler block and mapping block. Then the second model is the combination between DOCSIS 2.0 with OFDM system. The OFDM design model consists of P/S block, cyclic prefix block, IFFT and FFT block. The HFC channel model made by generates the thermal noise, impulse, ingress and micro reflections.*

*OFDM have a good performance on HFC network equal to DOCSIS 2.0 on QPSK modulation, there are 2-3dB processing gain. In 16QAM modulation, OFDM system is worse than DOCSIS, but that only for ingress noise channel. OFDM throughput are better then DOCSIS, but for 16QAM the OFDM throughput have a poor performance, that never reaches 100%.*

*Key Words : OFDM, HFC, DOCSIS.*

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