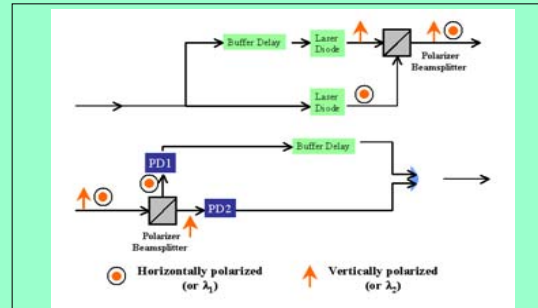


## Introduction

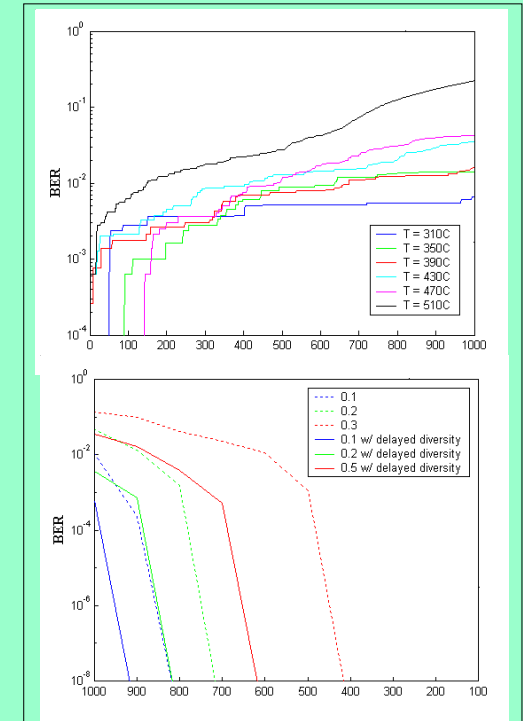
Free space optical communication is rapidly becoming an attractive way of connecting urban area customers to the fiber optic communication network. However, the atmosphere is not an ideal optical channel: atmospheric turbulence cause fluctuations in the received signal level, hence increases the effective noise in the system.

We are studying an orthogonal polarization channel delayed diversity scheme, which introduces some channel latency, but offers significant performance improvement in optical wireless links.

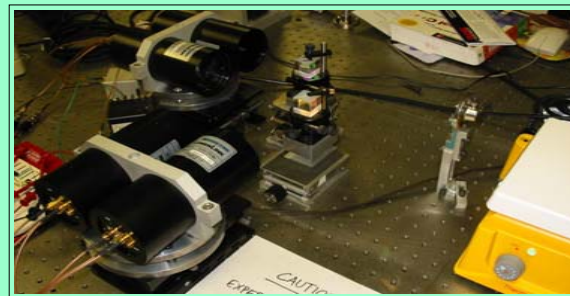
## Schematic diagram



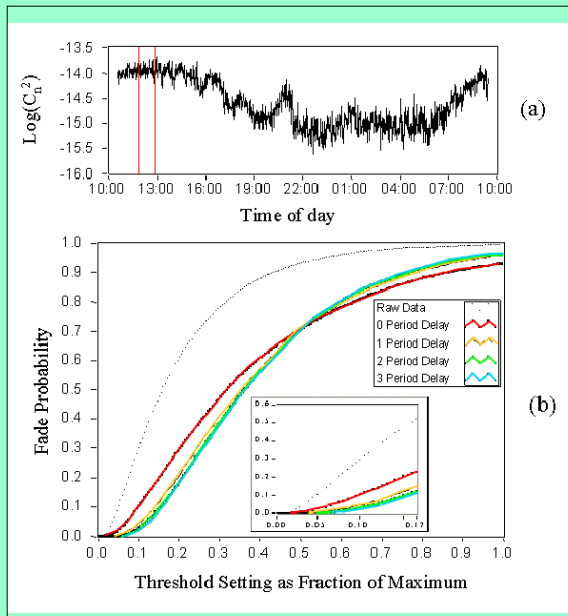
## Experimental results



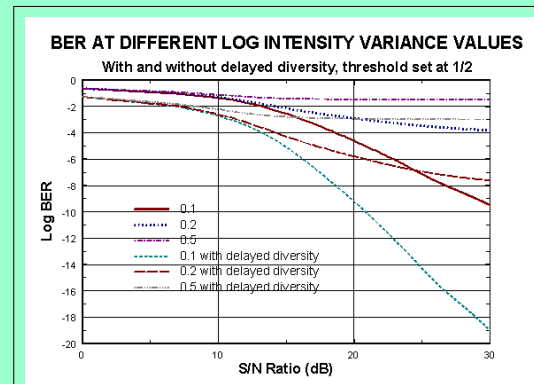
## Experimental Setup



## Long range measurement



## Theoretical performance



## Conclusion

The turbulent atmospheric channel is not chiral and produces little or no crosstalk effects on transmitted orthogonal polarizations channels. With a sufficiently long time delay, the turbulence seen on the link by these two channels becomes uncorrelated. There is 3dB penalty for dividing transmitted power but joint fade probability increase by 20-30dB. Delays beyond about 10ms do not significantly improve link performance.