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## Prediction rain attenuation effect on free space optical communication Kuching/Samarahan Region

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# Prediction rain attenuation effect on free space optical communication Kuching/Samarahan region

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**Abstract.** Rain attenuation is significantly affecting the FSO performance of a free-space optical communication system. Kuching/Samarahan region is situated in Malaysia state which is under tropical climate zone. The rain distribution is recorded high due to having rain season year-round. It worst when turn to monsoon season where the precipitation rate is expected high and dense. It is crucial to design the effect FSO system to ensure good quality transmission beam signal. This paper is focus on Kuching/Samarahan zone as the preliminary result to investigate the rain pattern and effect over FSO propagation. The investigation it focuses on that region is due to development that area to implement fully digital economy which need supported by high speed and capacity data that can be produced by optical technology. Therefore, FSO technology can perform this task. The rain data is collected from Malaysia Meteorology Department (Met Malaysia) which for three years 2017, 1018 and 2019. The performance will measure the effect of scattering coefficient, rain attenuation and geometrical loss. It is expected heavy rain will contribute the great impact over FSO link.

## INTRODUCTION

FSO stands for free space optics, define by data transmission via the atmosphere using light propagation for optical communication [1]. FSO is a line-of-sight (LOS) technology which operates by a light source as shown in Figure 1. Light propagation is employed to deliver optical bandwidth connections for optical transmission through the free space, whether it is air, space, or vacuum. It is an equivalent concept to fiber optic cables for optical transmission [2]; the difference is the medium for the transmission.

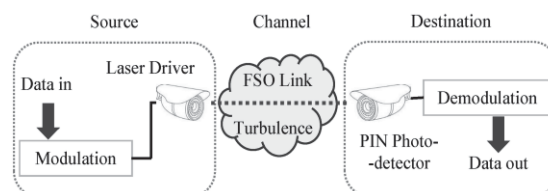


Figure 1. FSO Transmission