Abstract

The importance of optical wireless communication has growing for underwater channel as it has ability of equipping high bit rates based on low power and small size requirement. Also, wireless is the reliable solution typically in the case of underwater, because of this nature of such unguided medium is very harsh and rough. In this thesis direct detection/ intensity modulation (DD/IM) is experimentally investigated in the form of pulse width modulation (PWM). Three wavelengths are utilized (450, 532, 650)nm to assess the feasibility of selection the suitable water channel with 50mW as incident power. Signal to noise ratio (S/R), sample error rate (SER) are inspected for five different water channel. These are tap water, different concentrations of Maalox (Mg(OH)2 and Al(OH)3) and salt in order to obtain high turbidity water. Results show that Maalox and salt content decrease the received power and interrupt the communicating link. Longest wavelength demonstrates better performance due to high turbidity water which was 35.417dB for S/N along 2m. In contrast, with 532nm wavelength has a preference in clear water channel with free error S/N of 46.808dB over 7m. Lastly, 450nm wavelength has the best power maintained through clear water channel. The five utilized water channels are compared with Iraqi's water. Results of concentration of Maalox and salt with Iraqi's water that depended on received power results, are approximated.