Fibre optic cables have become the main driving force behind high data throughput infrastructure. In modern wideband communication systems, they are deployed as backbone cables in many long haul links as well as links to clients (Fibre to home). Several Gigabits per second data rates have become common. Field engineers need to have a thorough knowledge of physics behind any physical component used to accomplish fibre optic cable deployment tasks. To investigate different phenomena in such fibre optic links design, a 10 Km repeaterless backbone link, arbitrarily between an onshore control station and an offshore configuration terminal, is designed. Design process is done based on specifications of products already on market. Power and bandwidth constraints are taken into account as major causes of errors upon signal reception. The link budget is done by combining different fibre optic link design approaches from a number of sources. Precise and summarised tables for quick power and bandwidth budgeting process are depicted. Design simulation is done by Optisystem 8.0 simulation software, a product of optiwave Inc. The relationship between Quality factor (Q-factor) and BER (Bit Error Rates), their implications on received signal and how both are affected by different physical phenomena in optical communication systems is illustrated. Finally, quick design tables are drawn and graphs for design safety margin that conforms to ITU recommendations are plotted. The same tables can be extended and or modified to be customised to designer’s target.
A Quick Pre-Deployment Fibre Optic Link Design Methodology based on Q-factor in a Digital Eye

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