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Development of Optical Fiber Communication Receiver System in Industrial Physics/ eEngineering

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Abstract—*This paper deals with development of optical fiber communication receiver system. The optical receiver which is calculate the nearby object with the help of QUANTUM NOISE, DARK NOISE AND THERMAL NOISE. The LASER which is the part of this type of fiber is so called DFB design and is essentially a short and robust laser cavity. Low Noise Fiber Lasers also play an important role in new generation of Wind Sensing Lidar System. The NIF laser fusion research program at Lawrence liver more. National Laboratory is another program that has exploited high-precision DFB Fiber lasers. The NKT Photonics low-noise Fiber lasers inside the ASMs are designed to match the helium transition line at 1083nm. The light pumps helium in the magnetometer. Energy gaining know-How of the lager requirements to make its DFB Fiber lasers suitable sources for Wind Lidr System which is the part of Industrial Physics/Engineering.*

Keywords: *NIF, DFB, NKT, ASMs, Fiber lasers.*

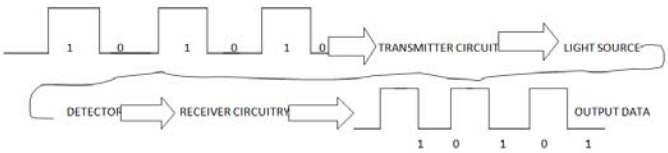
INTODUCTION

Optical Fiber Sensors comprise a light source Optical Fiber, external transducer and photo detector. They sense by detaching the modulation of one or more of the properties of light that is guided inside the Fiber intensity, wavelength or Polarization for instance. That produce a direct fashion by external Perturbation which caused by Physical parameter to be measured. This is inferred from changes detected due to the property of light.

BASIC OPTICAL FIBER ERROR PROCESS

When the input data in the form of electrical signals is given to the transmitter circuit; it convert them into light signal with the help of a light source. Which is of LED whose amplitude, frequency and phases must remain stable and free from fluctuation in order to have efficient transmission. The beam of light from the source is carried by a fiber-optic cable to the destination circuit where in the information is transmitted back to the electric signal by a receiver circuit.

INPUT DATA



SOURCES OF NOISE

Photo dector is used to optical receiver. Which consider the digital data from different Optical Receiver which has give the signal to the Receiver.

There are Statical Phonoic nature which is presence of signal i. e;called Quantum Noise. Whenever the signal are absent. That is used Dark Current Noise. It has two types BULK DARK CURRENT NOISE which has inside the device and SURFACE DARK CURRENT NOISE. THERMAL NOISE which has Addetive in Nature. The signal come from about the Noise and so on.

TECHONOLOGY

Interferometric Fiber-Optic Sensing systems have become important tools for oil and gas exploitation, perimeter security and wind detection, the optical fiber typically acts as a long continuous sensor that is highly sensitive to acoustic perturbations from the surroundings. The small influences induced by the environment cause a change of the optical path length in the fiber; when interrogated by coherent laser light and recombined with unperturbed reference light from the laser source itself on a Photo detector, an acoustic finger print is produce by means of data. This finger print provide detailed information about the event at a fixed location along the Fiber. With the help of perimeter surveillance Fiber Optic systems use algorithms to discriminate background noise that can arise from such sources as rain droplets, so that alarm are triggered only by relevant and potentially critical events.

NKT photonics has been manufacturing low noise, single-frequency Fiber lasers since 1997 for global research Integrators and the space and defence Industries. This type of Fiber Laser is so-called Distributed-feed back DFB. Design and is essentially a short and robust laser cavity. The high Φ value and the Lelatively long length of the DFB cavity combined with long radiative life times of rare earth ions in silica which provide for fundamental ally low values of phase noise and spectral line width.

ADVANTAGE

This Fiber lasers also play a vital role in a new generation of wind-sensing, light-detection and ranging (lidar), system for meteorology. Where the Doppler shift of light Scattered by aerosols (mie scattering) is used to indirectly measure wind velocity by co-herent homodyne detection. This requires a single frequency narrow line width source that can deliver up to 1W of optical power, but also to detect the very weak backscatter from particles carried by the wind. The laser emits light in the wavelength region at 1. 5μm.

FUTURE

The use of laser anemometry will be important for future in the field of wind resources management as the accurate prediction of energy yield is the vital to the success of wind from projects. In addition, raising anemometry masts requires building permits and dealing with health and safety aspects. The ability to reliably predicts wind speed and direction will aid in controlling the pitch of the turbines, blads for increased power and even more importantly to reduce load on large structures of turbine. NKT Photonics has worked closely with wind energy research center RisΦ. DTU National Laboratory of sustainable energy gaining know how of the lasers requirements to mark its DFB Fiber lasers which is suitable of wind lidar systems. ASM is an instruments which carry of Satellites. The NKT Photonics Low noise Fiber lasers inside them are designed to match He-Helium transition line at 1083nm;which helps that instrument for develop a electronic magnetic resonance effects on the environment of Satellites. The Fiber laser which has not used for sensing in this case. It is in the master ooscillator circuit provides the stable pulses that are then split and tremendously amplified for various experimental use. It provide reliable and stable long-term operation without failures and degration. That has provide the new target of Industrial Physics/Enginerring.

CONCLUSION

This paper discusses thorough about the error finding by Fiber optics and lasers. After that it tells about the New Scenario of technology used and its reliable effect. Finally it shows all the future aspects which will be in the market, out of which some became absolute and some are still in use for research and for developing general or Industrial development.

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