KIT Scientists Successfully Transmit Data Over A Laser Beam At 26 Terabits Per Second!

Posted by Kunal Mathur on May 24, 2011

Researchers at Karlsruhe Institute of Technology in Germany achieved an unimaginable feat by encoding a huge amount of data over a single laser beam and then sending it to the receiver at a superfast data rate of 26 terabits per second. It is a world record for the largest data volume to be ever sent over a single laser beam. The data was carried over a distance of 50 kilometers before it was correctly decoded and the original message signal was recovered. The information exchange takes place so fast that you can copy the data of approximately 700 DVDs in a second! The research got published in the latest issue of the famous science journal *Nature Photonics*.

The team of KIT scientists broke their own record of 10 terabits per second which they had achieved last year. For the record, 1 terabit is equivalent to 10,000 billion bits. The group of engineers and scientists is led by Prof. Jurg Leuthold of the Helmholtz Association of German Research Centres. The reason behind this enormous data transmission rate is the special decoding technique used by the KIT team. It is an optical-electrical method. In this, first the higher order data rates undergo pure optical calculations. After the bit sequence is broken down to smaller groups, the electrical data signsl processing methods are utilised for decoding. The bit rate reduction by optical method is essential because no electronic method allows data processing at rates as high as 26 terabits per second.

The OFDM(Orthogonal Frequency Division Multiplexing) is a widely used multiple access scheme used commonly in mobile telecommunication systems. The same technique has now been impemented by Leuthold and his team for high speed data encoding. OFDM is based on the Fast Fourier Transform which is a very efficient mathematical tool. The method was used to successfully increase the data processing speed by a factor of 1000000. The novel idea of using optical implementation of this mathematical routine proved to be not only fast but also very energy efficient.

This discovery implies that the physical limits of the maximum data rate and data handling capacity are not yet reached. It is a good thing because the internet traffic and data volume are increasing exponentially. A few years back, no one would have believed that such great transmission speeds are attainable. Another thing is that there was not even the need of 26 terabit per second speed for any application at that time. But in this age of cloud computing where videos and other media forms are constantly streamed by millions of users at the same time, no speed is enough.

The research has recieved a lot of appreciation from scientists and network analysts all around the globe. Though the experiments were done in the Karlsruhe Institute, researchers and firms from all over Europe were involved in it such as members of the staff of Agilent and Micram Deutschland, Time-Bandwidth Switzerland, Finisar Israel, and the University of Southampton in Great Britain. Well, it seems that the internet speeds will be boosted beyond our imagination in the near future by such innovations. Let us hope that it gets implemented commercially as soon as possible.

Image Credit: www.kit.edu

Filed in: VoiCE **Tags:** data at high speed, data over laser beam, Kalsruhe scientist, kalsruhe set record, Karlsruhe Institute Of Technology, KIT, KIT world record

Related Posts

- KIT's Superconductors To Aid Boxberg Powerplant
- 3D Invisibility Cloak That Works In Visible Light Spectrum Developed At KIT
- Karlsruhe Institute Of Technology Researchers Create High Specific Capacity Iron Carbon Batteries

Advertisements

Like

Add New Comment

Login

Type your comment here.

Showing 0 comments

Sort by newest first

M Subscribe by email S RSS

Reactions