

2014 年 10 月 27 日

●アイントホーフェン工科大学とセントラルフロリダ大学、データ転送率の新記録樹立

【ScienceDaily, 2014/10/27】

アイントホーフェン工科大学、セントラルフロリダ大学の研究チームは、新しいタイプの光ファイバを用いて、現在用いられている通信ネットワークの 21 倍以上の帯域を実現。データ転送率 255Tbps という新記録を樹立したと「Nature Photonics」誌上で発表した。

インターネットの普及やデータセンターの増加で、電気通信の帯域需要は今後も指数的に高まっていくと予想されている。

この需要成長に従来のガラス製ファイバで対応するには信号の出力を上げる必要があるが、そうすると転送後に復旧できる情報の量が制限されてしまう。

今回の実験で使われた新しいタイプのファイバは、光が進むコアを 7 つ持ち、データ伝送路に直交する 3 つの面を用意。これにより通信量を増加し、復旧できる情報量の制限も緩和することに成功した。

(参考) 本件報道記事

Record data transmission over a specially fabricated fiber demonstrated

Summary:

Researchers report the successful transmission of a record high 255 Terabits/s over a new type of fibre allowing 21 times more bandwidth than currently available in communication networks. This new type of fiber could be an answer to mitigating the impending optical transmission capacity crunch caused by the increasing bandwidth demand.

Researchers at Eindhoven University of Technology (TU/e) in the Netherlands and the University of Central Florida (CREOL) in the USA, report in the journal Nature Photonics the successful transmission of a record high 255 Terabits/s over a new type of fibre allowing 21 times more bandwidth than currently available in communication networks. This new type of fibre could be an answer to mitigating the impending optical transmission capacity crunch caused by the increasing bandwidth demand.

Due to the popularity of Internet services and emerging network of capacity-hungry datacentres, demand for telecommunication bandwidth is expected to continue at an exponential rate. To transmit more information through current optical glass fibres, an option is to increase the power of the signals to overcome the losses inherent in the glass from which the fibre is manufactured. However, this produces unwanted photonic nonlinear effects, which limit the amount of information that can be recovered after transmission over the standard fibre.

New class of fibres The team at TU/e and CREOL, led by dr. Chigo Okonkwo, an assistant professor in the Electro-Optical Communications (ECO) research group at TU/e and dr. Rodrigo Amezcua Correa, a research assistant professor in Micro-structured fibres at CREOL, demonstrate the potential of a new class of fibre to increase transmission capacity and mitigate the impending 'capacity crunch' in their article that appeared in the online edition of the journal *Nature Photonics*.

More than 20 times the current standard The new fibre has seven different cores through which the light can travel, instead of one in current state-of-the-art fibres. This compares to going from a one-way road to a seven-lane highway. Also, they introduce two additional orthogonal dimensions for data transportation -- as if three cars can drive on top of each other in the same lane. Combining those two methods, they achieve a gross transmission throughput of 255 Terabits/s over the fibre link. This is more than 20 times the current standard of 4-8 Terabits/s.

European Union MODEGAP Project

Dr. Chigo Okonkwo: "At less than 200 microns in diameter, this fibre does not take noticeably more space than conventional fibres already deployed. These remarkable results, supported by the European Union Framework 7, MODEGAP, definitely give the possibility to achieve Petabits/s transmission, which is the focus of the European Commission in the coming 7 year Horizon 2020 research programme. The result also shows the key importance of the research carried out in Europe, and in particular at TU/e with other well-known teams around the world in high-capacity optical transmission systems."

Source:<http://www.sciencedaily.com/releases/2014/10/141027085215.htm>

以 上