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100 Tbit/s spectral-efficient Data Link Using Orbital Angular Momentum Multiplexing

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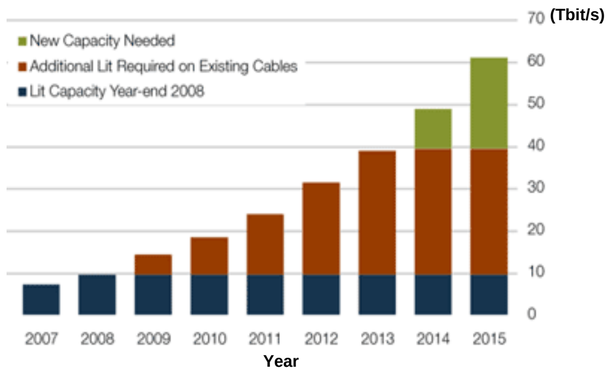
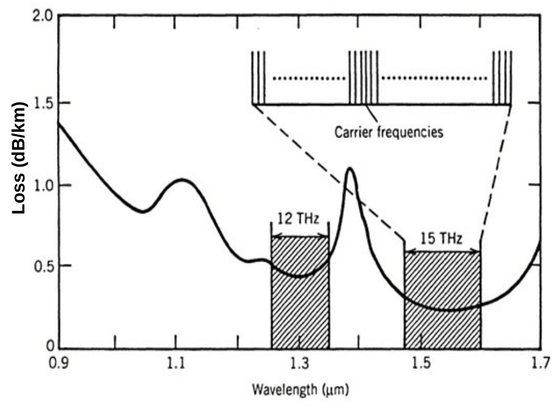
Problem: Bandwidth demand > Spectral resource



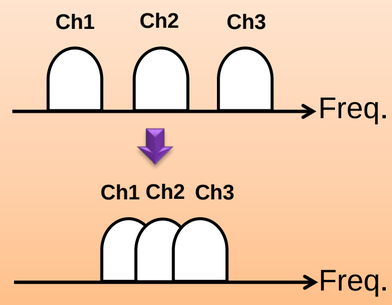
- >60 Tbit/s capacity is needed by 2015.



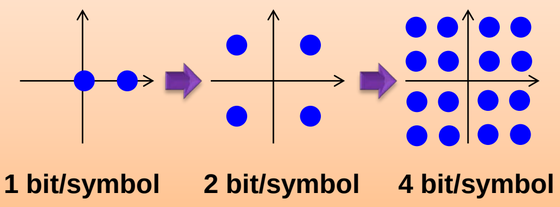
- Spectral resource is limited, even for optics.

Existing Solutions

- squeeze the channel spacing



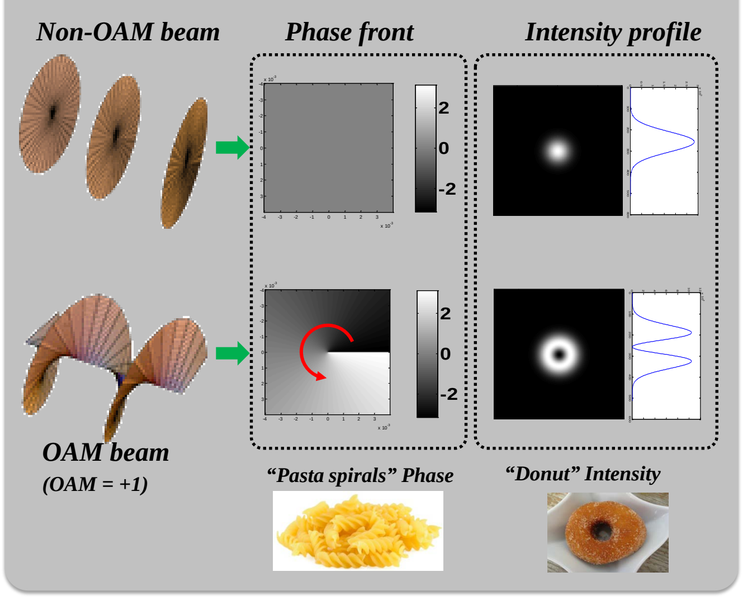
- Utilize advanced modulation formats



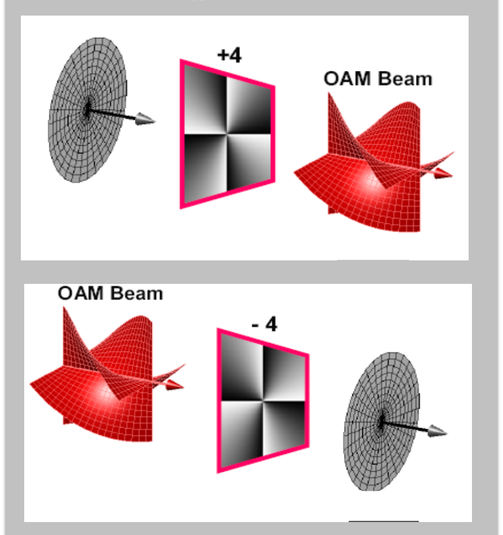
Spectral efficiency is improved by 4 times, but we need more.

Know about OAM

What is OAM

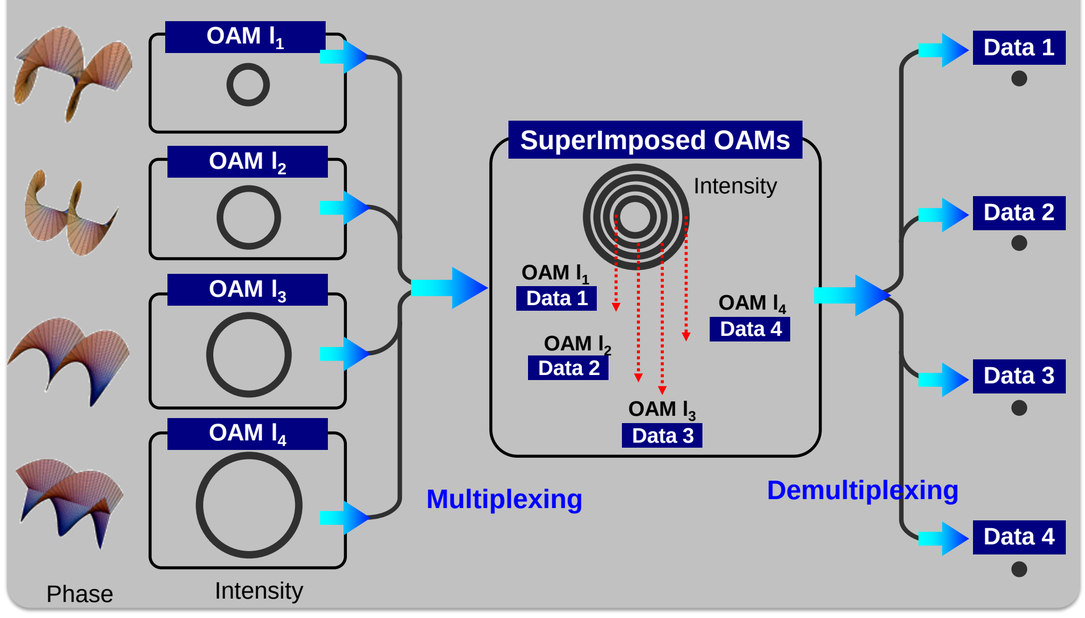


How to generate OAM

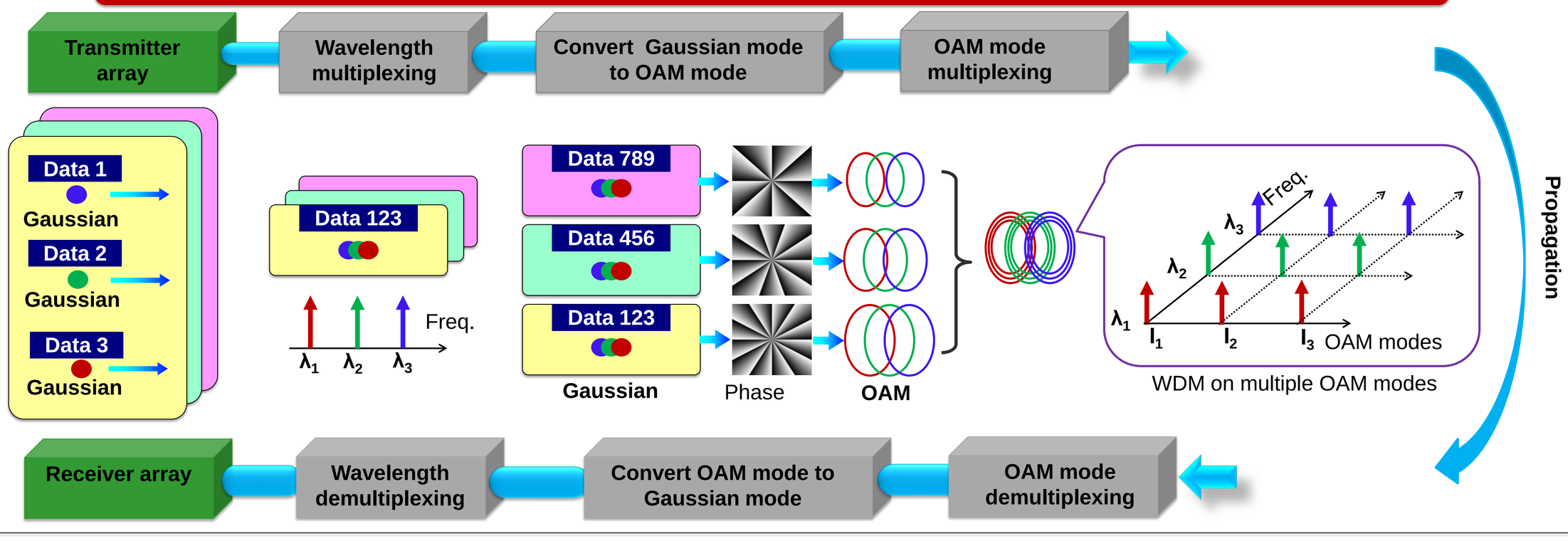


How to detect OAM

OAM multiplexing/demultiplexing

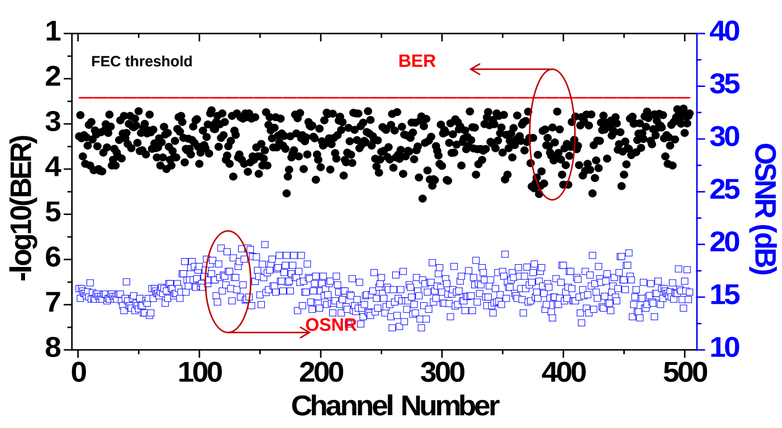


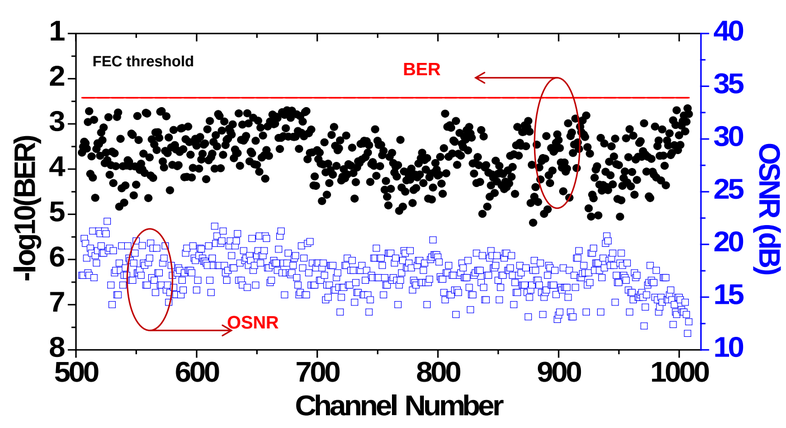
OAM is a new degree of freedom to improve the spectral efficiency and capacity



Experimental results

3 modes | 6 modes | 12 modes | 24 modes





Achievements

- 42 wavelengths
- 24 OAM modes
- 1008 independent channels
- 100 Gbit/s QPSK on each channel
- Spectral efficiency ×24
- Total capaicty 100.8 Tbit/s

Hao Huang et al., OFC2013, paper OTh4G.5

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