composite signal is then modulated on to a single optical carrier of frequency 193.1 THz.

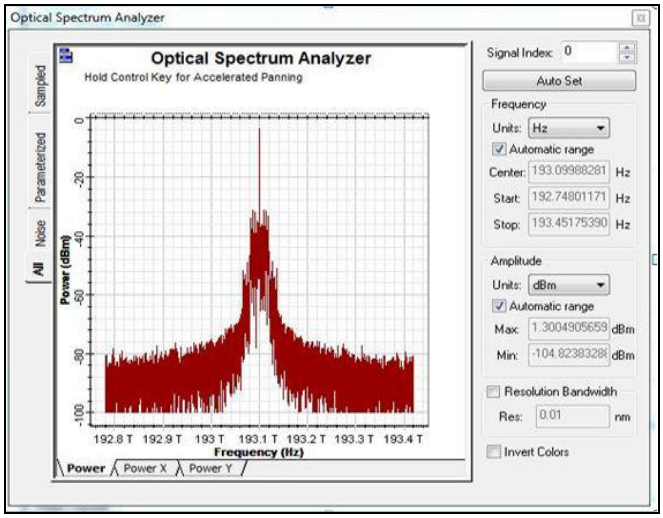

Figure 8: Spectrum of 4 channel sub carrier multiplexed signal.

The Figure 9 shows the spectrum of a hybrid WDM/SCM signal in two WDM channels each of which carries two SCM channels. As shown above there are two WDM channels centered at frequency of 193.1 and 193.2 THz, each of which carries two RF sub carriers of frequencies 2 and 5 GHz modulated with two data streams of bit rate 1 Gbps each.

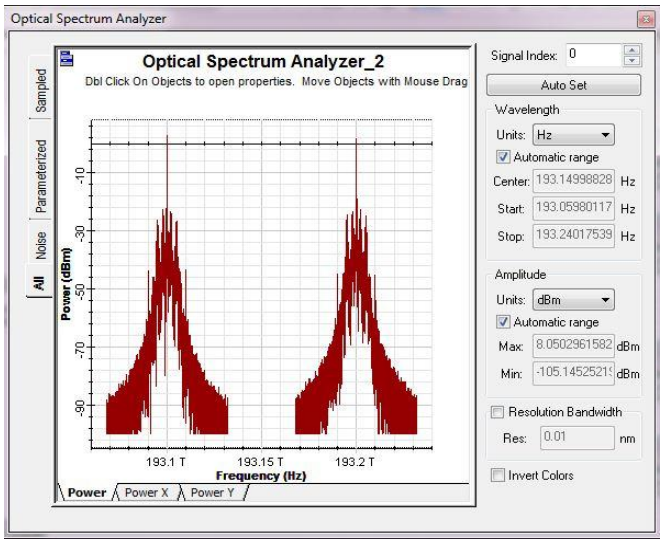

Figure 8: Spectrum of a hybrid WDM/SCM signal.

4. Conclusion

A WDM system allows multiple connections over a single fiber by assigning different wavelength channels for different connections, each which can operate at arbitrary data rates. In an SCM infrastructure, the baseband data is first modulated on a Gigahertz wide sub carrier that is subsequently modulated in the Terahertz optical carrier. SCM makes better use of available bandwidth and increases the spectral efficiency compared to WDM. Hence SCM is spectrally more efficient than WDM. But a hybrid WDM/SCM system in which each WDM channel carries an SCM composite signal provides more efficient utilization of optical bandwidth.

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