



**Title: Technology Advances in Deep Brain Stimulation**

**Author / Authors:** Luming Li

Tsinghua University/National Engineering Laboratory for Neuromodulation. China

**Abstract**

Deep brain stimulation (DBS) as a functional therapy is widely used in movement disorders such as Parkinson's Disease, dystonia etc. Recently, more and more researches show that DBS could help patients with psychiatric disorders, such as depression, OCD etc. On the other hand, the mechanism of DBS is still not in-depth understanding. The history of development of DBS in China is around 20 years. The novel feature of the device, contrasting to the conventional high frequency stimulation, a various frequency stimulation(VFS) therapy, combing low and high frequencies as a train, was invented. VFS shows great progress for gait problem treatment. The clinical outcome of VFS is presented in this talk. Another technology advance is remote programming, to transfer the programming data by internet in stead of in site which cause money and time burden particularly for patients in middle and west of China. To further understand why the different frequency has significant impacts or as a part of effect to the mechanism of DBS, DBS device was modified and considered as not only a therapy but a research tool also. Two studies will be presented in this talk. 1. DBS was designed to real time recording besides stimulation. 2. DBS was designed to be functional MRI compatible which means the devices, implanted in patient, could fulfill the safety requirement during scanning with DBS power on. This progress let us to compare what happened with or without stimulation.