1108-60-399   **Xiaoguang Wang*** (`wang913@purdue.edu`), 2113 Willowbrook Dr Apt 129, West Lafayette, IN 47906, and **Michael Levine** and **Frank (Jian) Zou**. *Asymptotic properties of functionals of increments of a continuous semi-martingale with stochastic trading times, with applications in integrated volatility estimation.*

As the ultra-high frequency data becomes available, nowadays new methods for integrated volatility estimation which can take use of as much high frequency data as we can are needed. Because of the complexity of the ultra-high frequency data, those new methods mostly are following non-parametric frameworks constructed on the blocks / functionals of the price data. However, most of those nonparametric methods require the price data to be equally spaced to obtain asymptotic result, such as the realized kernel method, and so on. On the other hand, the ultra-high frequency data available in the market is generally non-equally spaced, which indicates that applying those nonparametric methods means to throw away most of the data available to make the data equally spaced.

In our work, we constructed several LLNs and CLTs for functional of unequally-spaced data sampled from a continuous semi-martingale. We showed that based on appropriate constrains, the effect of randomness in sampling time or trading time can be controlled well to obtain useful asymptotic results on the functional of the differences of price data. And the CLTs provide us important tools to further construct nonparametric methods to estimate integrated volatility using ultra-high frequency data. (Received January 19, 2015)