1107-60-480 **Léo Neufcourt*** (ln2294@columbia.edu) and **Frederi Viens**. *A third moment theorem for quadratic variations of stationary Gaussian sequences.*

Inspired by central limit theorems and Berry-Esseen bound, we explore the convergence of normalized quadratic variations of correlated stationary Gaussian sequences to standard normal distribution. Complementing Nualart and Peccati's fourth moment theorem, which states that a sequence in a fixed Wiener chaos converges to a normal law if and only if its fourth cumulant tends to zero, Biermé, Bonami, Nourdin and Peccati recently proved using Malliavin calculus that the speed of convergence is dominated by the maximum of the fourth cumulant and the absolute value of the third cumulant. We go further and show that in the second Wiener chaos, a third moment theorem holds, in the sense that convergence to normal law occurs if and only if the third moment of the stationary sequence converges to zero. When the limit distribution is normal, we find the exact rate of convergence as a function of the covariance of the stationary sequence. When the quadratic variation process does not converge to normal distribution, we show that it converges 'slowly' to a Rosenblatt distribution, recovering a result from Dubroshin-Major. We finally apply our results to the example of the log-modulated fractional Brownian motion and exhibit critical Hurst parameters. This is joint work with Frederi Viens. (Received January 20, 2015)