A result of Fouque (1984) stands that for a standard Brownian motion B, the sequence of $\mathcal{S}'$-valued processes

$$S_t^n = \frac{1}{\sqrt{n}} \sum_{j=1}^{n} (\epsilon_{B_t^j} - E[\epsilon_{B_t^j}]),$$

where $(B^j,\, j \in \mathbf{N})$ are independent copies of B, converges in distribution to a generalized Ornstein-Uhlenbeck process. The main ingredients in this work are general result on convergence in nuclear spaces and the Itô formula. The problem addressed here is to generalize this result when the standard Brownian motion is replaced by a fractional Brownian motion of Hurst index in $(0,1)$, denoted by W. Since W is not a semi-martingale and that an Itô formula does not exist for W when $H < 1/2$, the method of Fouque can not be straightforwardly applied. The difficulty is bypassed by considering a sample-path valued semi-martingale χ, namely $\chi_t = \int_0^t K_H(.,s)\, dB_s$ (where K_H is defined in order that $W(t) = \int_0^t K_H(t,s)\, dB_s$) which is such that $\chi_t(t) = W^H$ and for which one can write an Itô formula. The methods of Fouque are then applicable to χ so that we can solve our original problem and show that $\frac{1}{\sqrt{n}} \sum_{j=1}^{n} (\epsilon_{W_t^j} - E[\epsilon_{W_t^j}])$, converges weakly in $\mathcal{S}'$ to a time changed generalized Ornstein-Uhlenbeck process.