

## Some Extensions of Fractional Brownian Motion and Sub-Fractional Brownian Motion Related to Particle Systems

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### Abstract

In this paper we study three self-similar, long-range dependence, Gaussian processes. The first one, with covariance

$$\int_0^{\min(s,t)} u^a [(t-u)^b + (s-u)^b] du,$$

parameters  $a > -1$ ,  $-1 < b \leq 1$ ,  $|b| \leq 1 + a$ , corresponds to fractional Brownian motion for  $a = 0$ ,  $-1 < b < 1$ . The second one, with covariance

$$(2-h)(s^h + t^h - (1/2)[(s+t)^h + |s-t|^h]),$$

parameter  $0 < h \leq 4$ , corresponds to sub-fractional Brownian motion for  $0 < h < 2$ .

The third one, with covariance

$$-(s^2 \log s + t^2 \log t - (1/2)[(s+t)^2 \log(s+t) + (s-t)^2 \log|s-t|]),$$

is related to the second one. These processes come from occupation time fluctuations of certain particle systems for some values of the parameters.

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