Functional limit theorems for generalized variations of the fractional Brownian sheet

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We prove functional central and non-central limit theorems for generalized variations of the anisotropic d-parameter fractional Brownian sheet (fBs), where d is any natural number. Whether the central or the non-central limit theorem applies depends on the Hermite rank of the variation functional and on the smallest component of the Hurst parameter vector of the fBs. The limiting process that corresponds to the former result is another fBs, independent of the original fBs, whereas the limit given by the latter result is an Hermite sheet, driven by the same white noise as the original fBs. As an application, we derive functional limit theorems for power variations of the fBs and discuss what is a proper way to interpolate them to ensure functional convergence.

The talk is based on joint work with Anthony Réveillac.