

## ON THE BESOV REGULARITY OF THE BIFRACTIONAL BROWNIAN MOTION

BY

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**Abstract.** Our aim is to improve Hölder continuity results for the bifractional Brownian motion (bBm)  $(B^{\alpha,\beta}(t))_{t \in [0,1]}$  with  $0 < \alpha < 1$  and  $0 < \beta \leq 1$ . We prove that almost all paths of the bBm belong to (resp. do not belong to) the Besov spaces  $\mathbf{Bes}(\alpha\beta, p)$  (resp.  $\mathbf{bes}(\alpha\beta, p)$ ) for any  $\frac{1}{\alpha\beta} < p < \infty$ , where  $\mathbf{bes}(\alpha\beta, p)$  is a separable subspace of  $\mathbf{Bes}(\alpha\beta, p)$ . We also show similar regularity results in the Besov–Orlicz space  $\mathbf{Bes}(\alpha\beta, M_2)$  with  $M_2(x) = e^{x^2} - 1$ . We conclude by proving the Itô–Nisio theorem for the bBm with  $\alpha\beta > 1/2$  in the Hölder spaces  $\mathcal{C}^\gamma$  with  $\gamma < \alpha\beta$ .

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**Key words and phrases:** bifractional Brownian motion, self-similar, Besov spaces, Besov–Orlicz spaces, Itô–Nisio.

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