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A large class of operators arise in connection with the Ornstein–Uhlenbeck semigroup, among which we will consider in this work the Gaussian Riesz transforms. Several authors have studied the boundedness of these transforms on $L^p(\mathbb{R}^n)$ spaces with respect to the Gaussian measure, using different approaches. We were interested in analyzing this problem in the more general context of variable Lebesgue spaces. Specifically, we give sufficient conditions on variable exponent functions $p : \mathbb{R}^n \rightarrow [1, \infty)$ for which the higher-order Riesz transforms associated with the Ornstein–Uhlenbeck semigroup, are bounded on $L^{p(\cdot)}(\mathbb{R}^n, d\gamma)$, where γ denotes the Gaussian measure. The key ingredient for obtaining our result is the estimate for the kernels of these transforms given in [SP].

[SP] S. Pérez. The local part and the strong type for operators related to the Gaussian measure. *J. Geom. Anal.*, 11(3):491–507, 2001.

Joint work with Roberto Scotto (Universidad Nacional del Litoral, Argentina).