A note on the multiple fractional integrals defined on the product of quasi-metric measure spaces

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A complete characterization of a vector-measure $\overrightarrow{\mu} = (\mu_1, \cdots, \mu_n)$ governing the boundedness of the multiple fractional integral operator

$$I^{\overrightarrow{\gamma}} f(x_1, \ldots, x_n) = \int_{X_1} \cdots \int_{X_n} \frac{f(y_1, \ldots, y_n) d\mu_1(y_1) \cdots d\mu_n(y_n)}{\prod_{j=1}^{n} \left(d_j(x_j, y_j)\right)^{1-\gamma j}}, \quad \overrightarrow{\gamma} = (\gamma_1, \ldots, \gamma_n)$$

from one mixed norm Lebesgue space $L^{\overrightarrow{p}}_{\overrightarrow{\mu}}$ to another one $L^{\overrightarrow{q}}_{\overrightarrow{\mu}}$ is obtained, where (X_i, d_i, μ_i), $i = 1, \ldots, n$, are quasi-metric measure spaces (spaces of nonhomogeneous type).

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