FRACTIONAL INTEGRAL ASSOCIATED WITH SCHRÖDINGER OPERATOR ON VANISHING GENERALIZED MORREY SPACES

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Abstract. Let $L = -\Delta + V$ be a Schrödinger operator, where the non-negative potential $V$ belongs to the reverse Hölder class $R\text{H}_{n/2}$, let $b$ belong to a new $BMO_{\theta}(\rho)$ space, and let $I^L_\beta$ be the fractional integral operator associated with $L$. In this paper, we study the boundedness of the operator $I^L_\beta$ and its commutators $[b, I^L_\beta]$ with $b \in BMO_{\theta}(\rho)$ on generalized Morrey spaces associated with Schrödinger operator $M^{\alpha_V}_p, \phi$ and vanishing generalized Morrey spaces associated with Schrödinger operator $VM^{\alpha_V}_p, \phi$. We find the sufficient conditions on the pair $(\phi_1, \phi_2)$ which ensures the boundedness of the operator $I^L_\beta$ from $M^{\alpha_V}_p, \phi_1$ to $M^{\alpha_V}_q, \phi_2$ and from $VM^{\alpha_V}_p, \phi_1$ to $VM^{\alpha_V}_q, \phi_2$. When $b$ belongs to $BMO_{\theta}(\rho)$ and $(\phi_1, \phi_2)$ satisfies some conditions, we also show that the commutator operator $[b, I^L_\beta]$ is bounded from $M^{\alpha_V}_p, \phi_1$ to $M^{\alpha_V}_q, \phi_2$ and from $VM^{\alpha_V}_p, \phi_1$ to $VM^{\alpha_V}_q, \phi_2$.


Keywords and phrases: Fractional integral associated with Schrödinger operator, commutator, BMO, vanishing generalized Morrey space associated with Schrödinger operator.

REFERENCES


