

Commutators of generalized fractional integral operators on generalized Morrey spaces

Ryutaro Arai

Ibaraki University, Japan

Let $b \in \text{BMO}(\mathbb{R}^n)$ and T be a Calderón-Zygmund singular integral operator. In 1976 Coifman, Rochberg and Weiss proved that the commutator $[b, T] = bT - Tb$ is bounded on $L^p(\mathbb{R}^n)$ ($1 < p < \infty$), that is,

$$\|[b, T]f\|_{L^p} = \|bTf - T(bf)\|_{L^p} \leq C\|b\|_{\text{BMO}}\|f\|_{L^p},$$

where C is a positive constant independent of b and f . For the fractional integral operator I_α , Chanillo proved the boundedness of $[b, I_\alpha]$ in 1982. These results were extended to Morrey spaces by Di Fazio and Ragusa in 1991.

In this talk we show the boundedness of the commutator $[b, I_\rho]$ on generalized Morrey spaces with variable growth condition, where I_ρ is a generalized fractional integral operator with $\rho : \mathbb{R}^n \times (0, \infty) \rightarrow (0, \infty)$ and b is a function in generalized Campanato spaces with variable growth condition.

This is a joint work with Professor Eiichi Nakai.