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**Michinori Ishiwata\*** (ishiwata@sigmath.es.osaka-u.ac.jp), 1-3, Machikaneyama, Toyonaka, Osaka, 560-8531, Japan. *On the existence and nonexistence of maximizers for variational problems associated with Sobolev type embeddings in  $\mathbb{R}^N$ .*

In this talk, we consider the attainability of a maximizing problem

$$D := \sup_{\|u\|_{H_\gamma^{1,N}}=1} (\|u\|_N^N + \alpha \|u\|_p^p),$$

where  $N \geq 2$ ,  $N < p < \infty$ ,  $\alpha > 0$ ,  $\gamma > 0$  and  $\|u\|_{H_\gamma^{1,N}} = (\|u\|_N^\gamma + \|\nabla u\|_N^\gamma)^{\frac{1}{\gamma}}$ . The existence of a maximizer for  $D$  is closely related to the exponent  $\gamma$ . In fact, we show that the value

$$\alpha = \alpha_* := \inf_{\|u\|_{H_\gamma^{1,N}}=1} \left( \frac{1 - \|u\|_N^N}{\|u\|_p^p} \right)$$

is a threshold in terms of the attainability of  $D$ .

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