Michinori Ishiwata* (ishiwata@signath.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

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

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

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

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

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