



Joint meeting of V.I. Smirnov Seminar on Mathematical Physics and the “Industrial mathematics” seminar

Monday, 27 april 2020, 17:30 (Moscow time, GMT+3)

Compactness of Sobolev embeddings on non-compact manifolds



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We discuss generalizations of a result of Walter Strauss from 1977 that states that subcritical Sobolev embeddings on \mathbb{R}^N become compact in restriction to the subspace of radially-symmetric functions. We consider Sobolev spaces of a general non-compact manifold M and two types of subspaces:

- (1) subspaces defined by invariance with respect to a compact group G ;
- (2) subspaces of functions with reduced number of variables, namely functions of the form $f \circ \varphi$, where $\varphi : M \rightarrow N$ is a given function and N is a manifold of lower dimension than M .

In both situations we give necessary and sufficient conditions, on G and φ respectively, for compactness of subcritical Sobolev embeddings on subspaces. Examples of $\varphi : \mathbb{R}^m \rightarrow \mathbb{R}$ include $\sum_i |x_i|$ and $\max_i |x_i|$. This is a joint work with Leszek Skrzypczak.

Everyone is welcome!