

## **ABSTRACT**

The measure of non-compactness is defined for any continuous mapping  $T: X \rightarrow Y$  between two Banach spaces  $X$  and  $Y$  as

$$\beta(T) := \inf \left\{ r > 0: \begin{array}{l} T(B_X) \text{ can be covered by finitely} \\ \text{many open balls with radius } r \end{array} \right\}.$$

It can easily be shown that  $0 \leq \beta(T) \leq \|T\|$  and that  $\beta(T) = 0$ , if and only if the mapping  $T$  is compact.

My supervisor prof. Stanislav Hencl has proved in his paper that the measure of non-compactness of the known embedding  $W_0^{k,p}(\Omega) \rightarrow L^{p^*}(\Omega)$ , where  $kp$  is smaller than the dimension, is equal to its norm.

In this thesis we prove that the measure of non-compactness of the embedding between function spaces is under certain general assumptions equal to the norm of that embedding. We apply this theorem to the case of Lorentz spaces to obtain that the measure of non-compactness of the embedding

$$W_0^k L^{p,q}(\Omega) \rightarrow L^{p^*,q}(\Omega)$$

is for suitable  $p$  and  $q$  equal to its norm.