



Go Hirasawa (gou@mx.ibaraki.ac.jp), Ibaraki University College of Engineering, Hitachi-shi, Ibaraki-ken, 316-8511 Japan, *The metric between Sobolev spaces.*

ABSTRACT. Let $W^{m,2}(\mathbb{R})$ be Sobolev spaces in Hilbert space $L^2(\mathbb{R})$. We define the ρ -metric between Sobolev spaces and calculate the value of the distance among them. From this metric, we can introduce the q -metric for differential operators whose domains are Sobolev spaces. The q -metric is not special but so natural. In fact, it is a generalization of the metric induced from the operator norm in the set of all bounded operators $\mathcal{B}(L^2(\mathbb{R}))$. These topological ρ - or q -metrics can be generalized to abstract unbounded operator theory in a Hilbert space.