On orthogonal decomposition of a Sobolev space.

The theme of this research is to investigate an orthogonal decomposition of the Sobolev space $W^{1,2}(\Omega)$ as $W^{1,2}(\Omega) = A^{2,2}(\Omega) \oplus D^{2}(W^{3,2}_0(\Omega))$ and look at properties of the inner product therein and the distance defined from the inner product. We also see the structure of the orthogonal difference space $W^{1,2}(\Omega) \ominus (W^{1,2}_0(\Omega))^\perp$ and the expansion of Sobolev spaces as their regularity increases. (Received August 23, 2017)