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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 $W^{1,2}(\Omega) = A^{2,2}(\Omega) \oplus D^2(W_0^{3,2}(\Omega))$ 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 $W^{1,2}(\Omega) \ominus (W_0^{1,2}(\Omega))^\perp$ and the expansion of Sobolev spaces as their regularity increases (Received August 23, 2017)