1154-46-621 **Dejenie Alemayehu Lakew*** (dejenieal@gmail.com), 7933 Arbor Ponds Terr, New Kent, VA 23124. *On Orthogonal Components of a Solution to a Cauchy BVP.* Preliminary report.

Let D be the Dirac operator and $k \geq 3$. It will be shown that the Sobolev Space $W^{(k-1),2}(\Omega)(fork \geq 1)$ has an orthogonal decomposition given by

$$W^{(k-1),2}(\Omega) = A^{k,2}(\Omega) \oplus D^k(W_0^{(2k-1),2}(\Omega))$$

where D^k is the k^{th} order Dirac operator and $A^{k,2}(\Omega) = KerD^k \cap W^{(k-1),2}(\Omega)$, so that any function ψ in $W^{(k-1),2}(\Omega)$ can be written as an orthogonal sum $\psi = \phi \uplus \{\phi\}$ with $\phi \in A^{k,2}(\Omega)$ and $\{\phi\} \in D^k(W_0^{(2k-1),2}(\Omega))$. (Received September 08, 2019)