

In this bachelor thesis, we describe the construction of rotation invariant differential operators of first order on the Euklidean space  $\mathbb{R}^n$  given by E. Stein and G. Weiss. For this construction we show how to find an irreducible decomposition of a tensor product of representations of group  $Spin(n)$  into irreducible subrepresentations. We shall also prove the rotation invariance of the gradient operator. Then we apply the Stein-Weiss construction to produce some of well-known differential operators. Namely, we construct the Dirac operator in  $\mathbb{R}^n$  and Hodge-de Rham system of differential equations using this method.