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### **Spinorial Representations of Orthogonal Groups**

Let  $G$  be a real compact Lie group, such that  $G = G^0 \rtimes C_2$ , with  $G^0$  simple. Here  $G^0$  is the connected component of  $G$  containing the identity and  $C_2$  is the cyclic group of order 2. We give criteria for whether an orthogonal representation  $\pi: G \rightarrow O(V)$  lifts to  $\text{Pin}(V)$  in terms of the highest weights of  $\pi$  and also in terms of character values. From these criteria we compute the first and second Stiefel-Whitney classes of the representations of the orthogonal groups.

**Keywords:** Orthogonal group, spinorial representation, Stiefel-Whitney class, highest weight.

**MSC:** 22E41, 22E47, 57R20.