Abstract. Let π be a finite group. There is a geometric description of $KO_*(B\pi)$ which represents classes by compact spin manifolds. Taking the ρ-invariants of Dirac operators associated with these spin manifolds gives a homomorphism $KO_*(B\pi) \to A$, where A is a suitable abelian group. The ρ-invariant in this form has been used to prove special cases of the Gromov-Lawson-Rosenberg conjecture.

On the other hand, there is Greenlees' algebraic approach to KO-homology which describes $KO_*(B\pi)$ in terms of local cohomology groups of modules over the representation ring $RO(\pi)$.

In our talks we explain how to relate the geometric construction of the ρ-invariant to the algebraic picture by constructing a homomorphism

$$\hat{\rho}_* : \Omega_*^{Spin}(B\pi) \to H^1_{JO(\pi)}(KO_\pi^{-*-1})$$

taking values in the first local cohomology group of Atiyah-Segal π-equivariant KO-theory. We show that the invariant $\hat{\rho}$ is equivalent to ρ.