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EQUIVARIANT BIVARIANT CYCLIC THEORY AND EQUIVARIANT CHERN-CONNES CHARACTER

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ABSTRACT. We construct an equivariant bivariant cyclic theory, as a combination of equivariant cyclic and noncommutative de Rham theories for unital G-Banach algebras, where G is a compact Lie group. By incorporating the JLO formula and the superconnection formalism of Quillen, an equivariant bivariant Chern Connes character of Kasparov's G-bimodule is defined, with values in the bivariant cyclic theory.

1. Introduction. It is known, due to Connes [**9**] and an equivalent but convenient version which is due to Jaffe, Lesniewski and Osterwalder and known as a JLO formula [**14**], that the Chern character of a θ summable Fredholm module $(\mathcal{H}, D)$ over a unital C^* algebra A, takes value in the entire cyclic cohomology of A. On the other hand, bivariant Chern-Connes character of Kasparov's kk bimodule, takes values in the bivariant cyclic theory [**27, 11, 21, 29, 30**].

Explicit formula of an equivariant Chern-Connes character, associated to the invariant Dirac operator, in the presence of a countable discrete group action on a smooth compact spin Riemannian manifold, was given by Azmi, [**1, 2**]. Moreover, in [**2**] it was shown that this equivariant cocycle is an element of the delocalized cohomology, and it pairs with an equivariant K-theory idempotent. In the case G is a compact Lie group, Chern and Hu [**6**] gave an explicit formula of an equivariant Chern-Connes character, associated to G-equivariant θ-summable Fredholm module.

In this paper we define an equivariant bivariant Chern-Connes character in the presence of a compact lie group, which acts by continuous automorphism on certain algebras. As a first step, we construct an equivariant bivariant cyclic theory. To motivate our construction, we recall some equivariant and bivariant cyclic theories.

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