1104-18-149 **Alexandru Chirvasitu*** (chirvasitua@gmail.com), 5507 1/2 26th Ave. NE, Seattle, WA 98105.
Semiperfect coalgebras as dualizable 2-abelian groups.

Many of the usual algebraic or geometric objects (algebras, coalgebras, schemes, etc.) can be regarded as objects of a bicategory of so-called 2-abelian groups. It consists of (sufficiently nice) linear categories, left adjoints, and natural transformations. The examples above can be recovered by identifying an algebra with its module category, a coalgebra with its comodule category, a scheme with its category of quasicoherent sheaves, etc.

Dualizability of objects in higher categories is a condition that comes up naturally in the classification and construction of topological field theories; it is analogous to being e.g. a finite-dimensional vector space in the category of vector spaces or a locally free sheaf among quasicoherent sheaves on some scheme.

When regarded as 2-abelian groups, categories of modules over algebras are always dualizable, with the dual being the category of modules over the opposite algebra. We will see that by contrast, the category of comodules over a coalgebra is dualizable exactly when the coalgebra in question is semiperfect.

I will also mention other examples of (non)dualizability, such as for categories of quasicoherent sheaves on projective schemes or quotient stacks. (Received August 29, 2014)