PIECEWISE PRINCIPAL COMODULE ALGEBRAS

PIOTR HAJAC

ABSTRACT. A comodule algebra P over a Hopf algebra H with bijective antipode is called principal if the coaction of H is Galois and P is H-equivariantly projective (faithfully flat) over the coaction-invariant subalgebra. We prove that principality is a piecewise property: given N comodule-algebra surjections $P \to P_i$ whose kernels intersect to zero, P is principal if and only if all P_i's are principal. Furthermore, assuming the principality of P, we show that the lattice these kernels generate is distributive if and only if so is the lattice obtained by intersection with the coaction-invariant subalgebra. Finally, assuming the above distributivity property, we obtain a flabby sheaf of principal comodule algebras over a certain space that is universal for all such N-families of surjections $P \to P_i$ and such that the comodule algebra of global sections is P.

INSTYTUT MATEMATYCZNY, POLSKA AKADEMIA NAUK, UL. SNIADECKICH 8, WARSZAWA, 00-956 POLAND

E-mail address: `P.M.Hajac@impan.gov.pl`