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Bernardo Villarreal*, bernvh@math.ubc.ca. *On the homotopy stable decomposition of spaces of homomorphisms.*

Let G be a real linear algebraic group and L a finitely generated cosimplicial group. We prove that the space of homomorphisms $Hom(L_n, G)$ has a homotopy stable decomposition for each $n \geq 1$. When G is a compact Lie group, we show that the decomposition is G -equivariant with respect to the induced action of conjugation by elements of G . In particular, under these hypothesis on G , we obtain stable decompositions for $Hom(F_n/\Gamma_n^q, G)$ and $Rep(F_n/\Gamma_n^q, G)$ respectively, where F_n/Γ_n^q are the finitely generated free nilpotent groups of nipotency class $q - 1$. We give the explicit stable decomposition for $Hom(F_n/\Gamma_n^q, SU(2))$ using a description of its connected components. This last description is joint work with O. Antolín. (Received January 30, 2017)