

1056-55-161

**Ainhoa Berciano** ([ainhoa.berciano@ehu.es](mailto:ainhoa.berciano@ehu.es)), University of the Basque Country, Departamento de Didáctica de la Matemática, Ramón y Cajal, 72., 48014-Bilbao(Bizkaia, Spain, **Sean Evans** ([sme26@pitt.edu](mailto:sme26@pitt.edu)), University of Pittsburgh, Department of Mathematics, Pittsburgh, PA 15260, and **Ronald Umble\*** ([ron.umble@millersville.edu](mailto:ron.umble@millersville.edu)), Millersville University of Pennsylvania, Department of Mathematics, 203 Wickersham Hall, Millersville, PA 17551.  *$A_\infty$ -Bialgebras of Type  $(m, n)$ .*

An  $A_\infty$ -bialgebra of type  $(m, n)$  is a Hopf algebra  $H$  equipped with a “compatible” operation  $\omega_m^n : H^{\otimes m} \rightarrow H^{\otimes n}$  of positive degree. We determine the structure relations for  $A_\infty$ -bialgebras of type  $(m, n)$  and construct a purely algebraic example for each  $m \geq 2$  and  $m + n \geq 4$ . (Received August 09, 2009)