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*Quantum shuffle algebras and the homology of braid groups.*

We study the homology of braid groups with coefficients in the exponential system coming from tensor powers of a Yetter-Drinfeld module  $V$ . One specific example of interest gives rise to the homology of Hurwitz moduli spaces of branched covers of the affine line. We identify these homology groups with the cohomology algebra  $Ext_A(k, k)$  of the quantum shuffle algebra  $A$  coming from  $V$ . Furthermore, we give criteria for producing a soft exponential bound on the growth of these homology groups. (Received August 26, 2016)