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Arturo Magidin* (magidin@member.ams.org), 217 Maxim Doucet Hall, P.O. Box 41010, Lafayette, LA 70504-1010. *The nilpotent product and the nonabelian tensor square of groups*. Preliminary report.

In 1956, Golovin defined nilpotent products of groups in response to a question of Mal'cev. If A and B are groups, the c -nilpotent product of A and B is defined to be $A \Pi^{\mathfrak{nc}} B = (A * B) / ((A * B)_{c+1} \cap [A, B])$, where $A * B$ is the free product and $(A * B)_{c+1}$ is the $(c + 1)$ st term of the lower central series of $A * B$; this is an associative product, and is generated by isomorphic copies of the factors. In 1960, T. MacHenry proved that the cartesian $[A, B]$ of $A \Pi^{\mathfrak{nc}} B$ is isomorphic to the abelian tensor product $A^{\text{ab}} \otimes B^{\text{ab}}$. We discuss a possible generalization of this result for $c > 2$ and $A = B$, involving the nonabelian tensor square of a group. (Received August 24, 2009)