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Nicholas D. Nguyen* (ndn004@math.ucsd.edu). *Exceptional Lie Groups, Commutators, and Commutative mod 3 Homology Rings*. Preliminary report.

The multiplication μ of a Lie group G induces an associative ring structure on its mod 3 homology $H_*(G; \mathbb{F}_3)$. In the case that $H_*(G; \mathbb{Z})$ has no 3-torsion, $H_*(G; \mathbb{F}_3)$ will be a (graded) commutative ring. However, if $H_*(G; \mathbb{Z})$ has 3-torsion, then $H_*(G; \mathbb{F}_3)$ will not be commutative. In particular, four of the five exceptional Lie groups have 3-torsion in their integral homology groups.

Nevertheless, we will find a different multiplication map ν on G which will make (G, ν) an H-space with $H_*(G; \mathbb{F}_3)$ a commutative ring (using ν_* as the ring multiplication). Furthermore, we construct ν using μ and the commutator map for the Lie group (G, μ) . In addition, we will generalize the process beyond Lie groups to finite simply-connected homotopy-associative H-spaces, and to odd primes larger than 3. (Received September 25, 2012)