

1079-22-300

**Sam Evens** and **William Graham\*** ([wag@math.uga.edu](mailto:wag@math.uga.edu)). *The relative Hochschild-Serre spectral sequence and the Belkale-Kumar product.*

We consider the Belkale-Kumar cup product  $\odot_t$  on  $H^*(G/P)$  for a generalized flag variety  $G/P$  with parameter  $t \in \mathbb{C}^m$ , where  $m = \dim(H^2(G/P))$ . For each  $t \in \mathbb{C}^m$ , we define an associated parabolic subgroup  $P_K \supset P$ . We show that the ring  $(H^*(G/P), \odot_t)$  contains a graded subalgebra  $A$  isomorphic to  $H^*(P_K/P)$  with the usual cup product, where  $P_K$  is a parabolic subgroup associated to the parameter  $t$ . Further, we prove that  $(H^*(G/P_K), \odot_0)$  is the quotient of the ring  $(H^*(G/P), \odot_t)$  with respect to the ideal generated by elements of positive degree of  $A$ . We prove the above results by using basic facts about the Hochschild-Serre spectral sequence for relative Lie algebra cohomology. We will discuss how to prove these facts using the original approach of Hochschild and Serre. (Received January 17, 2012)