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**David J Hemmer\*** (david.hemmer@utoledo.edu), 2801 West Bancroft, MS942, Toledo, OH 43606, and **Daniel K Nakano**. *Cohomology of Specht Modules*.

We investigate the cohomology of the Specht module  $S^\lambda$  for the symmetric group  $\Sigma_d$ . We show if  $0 \leq i \leq p - 2$ , then  $H^i(\Sigma_d, S^\lambda)$  is isomorphic to  $H^{s+i}(B, w_0 \cdot \lambda' - \delta)$  where  $s = \frac{d(d-1)}{2}$ ,  $B$  is the Borel subgroup of the algebraic group  $\mathrm{GL}_d(k)$  and  $\delta = (1^d)$  is the weight of the determinant representation. We obtain similar isomorphisms of  $\mathrm{Ext}_{\Sigma_d}^i(S^\lambda, M)$  with  $B$ -cohomology, which in turn yield isomorphisms of cohomology for Borel subgroups of  $\mathrm{GL}_n(k)$  for varying  $n \geq d$ . In the case  $i = 0$ , and the case  $i = 1$  for certain  $\lambda$ , we apply our result and known symmetric group results of James and Erdmann to obtain new information about  $B$ -cohomology. Finally we show that Specht module cohomology is closely related to cohomology for the Frobenius kernel  $B_1$  for small primes. (Received September 25, 2006)