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**Rod Gow**, School of Mathematical Sciences, University College, Dublin, 4, Ireland, and **C. Ryan Vinroot\***, University of Arizona Math. Dept., 617 N. Santa Rita Ave., P.O. Box 210089, Tucson, AZ 85719. *Extending real-valued characters of finite linear and unitary groups.*

Consider the finite general linear and unitary groups extended by the transpose-inverse automorphism  $\tau$ , and denote these by  $G\langle\tau\rangle = \text{GL}(n, \mathbb{F}_q)\langle\tau\rangle$  and  $U\langle\tau\rangle = \text{U}(n, \mathbb{F}_{q^2})\langle\tau\rangle$ , respectively, where  $q$  is a power of the prime  $p$ . Let  $n$  be odd, and let  $\chi$  be an irreducible character of  $G\langle\tau\rangle$  or  $U\langle\tau\rangle$  which is extended from a real-valued character of  $G$  or  $U$ , respectively. If  $y\tau$  is an element of  $G\langle\tau\rangle$  or  $U\langle\tau\rangle$  such that  $(y\tau)^2$  is regular unipotent in  $G$  or  $U$ , respectively, we show that  $\chi(y\tau) = \pm 1$  if  $\chi(1)$  is prime to  $p$ , and  $\chi(y\tau) = 0$  otherwise. This can be viewed as an extension of a result of Green, Lehrer, and Lusztig, which states that the degrees of characters of finite groups of Lie type are congruent modulo  $p$  to their values on regular unipotents. This result and other evidence suggests a strong relationship between the character values of  $G\langle\tau\rangle$  and  $U\langle\tau\rangle$  via Shintani descent. (Received September 07, 2007)