1048-11-346   **Adam Topaz*** (`adamtopaz@gmail.com`), Mathematics Department, University of Pennsylvania, 209 South 33rd Street, Philadelphia, PA 19104. *On the Galois Module Structure of Square Classes of Maximal Elementary Abelian 2-Extensions.*

Let E/F be the maximal elementary abelian 2-extension of a field F of characteristic not 2, with Galois group G, and let $J = E^\times/E^{\times 2}$ be the $\mathbb{F}_2 G$-module of square classes of the multiplicative group of E. Denote by J_k the kth element in the socle series for J as an $\mathbb{F}_2 G$-module. Adem, Gao, Karagueuzian, and Mináč determined necessary and sufficient conditions for the existence of an element in J_2 in terms of the existence of elements in J_1 and a class in $H^3(G, \mathbb{F}_2)$ expressed in terms of cup products and the transgression map on $H^1(E, \mathbb{F}_2)^G$. We produce a similar formula for J_k for any $k \geq 1$. (Received February 10, 2009)