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**Peter D Horn\*** (pdhorn@math.columbia.edu), Department of Mathematics, Columbia University - MC 4403, 2990 Broadway, New York, NY 10027, and **Tim D Cochran** and **Shelly L Harvey**. *Higher-order signature cocycles for subgroups of the mapping class group.*

This is joint work with Tim Cochran and Shelly Harvey. We define families of invariants for elements of the mapping class group of  $\Sigma$ , a compact, orientable surface. For a characteristic subgroup  $H \triangleleft \pi_1 \Sigma$ , let  $J(H)$  denote the subgroup of mapping classes that induce the identity map on  $\pi_1 \Sigma / H$ . To a unitary representation  $\psi$  of  $\pi_1 \Sigma / H$ , we associate a higher-order  $\rho$ -invariant,  $\rho_\psi$ , and a signature 2-cocycle  $\sigma_\psi$ , a generalization of the Meyer cocycle. We show that each  $\rho_\psi$  is a quasimorphism from  $J(H) \rightarrow \mathbb{R}$ , and that the  $\sigma_\psi$  span an infinite rank subgroup of  $H_{bounded}^2(J(H); \mathbb{R})$  (Received March 30, 2010)