Module Structure of the Parameterizing Space of Elementary p-Abelian Extensions in a Certain Free Case

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Let K/F be a Galois extension with Galois group G. By Kummer theory and Artin-Schreier theory, we know that the parameterizing space $J(K)$ of elementary p-abelian extensions of K is naturally equipped with the structure of an $F_p[G]$ module. This module encodes lots of Galois-theoretic and field-theoretic information. In particular, there is an explicit correspondence between submodules of $J(K)$ and elementary p-abelian extensions of K. For this reason, the module $J(K)$ is of great interest to number theorists. In this talk, we will describe the structure of $J(K)$ in the case where the maximal pro-p quotient of the absolute Galois group of F is a free, finitely generated pro-p group. This is based on joint work with Lauren Heller, Ján Mináč, Andrew Schultz, and Nguyn Duy Tân.