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On The Artin Conductor  $f_{\text{Artin}}(\chi)$  of a Character  $\chi$  of  $\text{Gal}(E/K)$  I: Basic Definitions

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**Abstract:** Let  $K$  be a local field with finite residue class field and  $E$  a finite Galois extension over  $K$ . In this paper, we study the Artin conductor  $f_{\text{Artin}}(\chi_\rho)$  of a character  $\chi_\rho$  associated to a representation  $\rho: \text{Gal}(E/K) \rightarrow \text{GL}(V)$  of  $\text{Gal}(E/K)$  with metabelian kernel  $\ker(\rho)$ . In order to do so, we first review the Artin character  $a_{\text{Gal}(E/K)}$  of  $\text{Gal}(E/K)$  and review the metabelian local class field theory. We finally propose the definition of the conductor  $f(E/K)$  of a metabelian extension  $E/K$  in the sense of Koch-de Shalit local class field theory, and compute  $f_{\text{Artin}}(\chi_\rho)$  under a suitable assumption.

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