

GALOIS EMBEDDING PROBLEMS WITH CYCLIC QUOTIENT OF ORDER p

JÁN MINÁČ^{*†} AND JOHN SWALLOW[‡]

ABSTRACT. Let K/F be a cyclic field extension of odd prime degree. We consider Galois embedding problems involving Galois groups with common quotient $\text{Gal}(K/F)$ such that corresponding normal subgroups are indecomposable $\mathbb{F}_p[\text{Gal}(K/F)]$ -modules. For these embedding problems we prove conditions on solvability, formulas for explicit construction, and results on automatic realizability.

INTRODUCTION

Let $p > 2$ be a prime, and suppose that K/F is a cyclic field extension of degree p . In this paper we consider Galois embedding problems involving Kummer extensions of K of degree p^n that are Galois over F , and we establish new automatic realizability results, whereby the solvability of one Galois embedding problem implies the solvability of another. (See e. g. [GSS, Section 5] for some automatic realizations of 2-groups as Galois groups.) We restrict ourselves to the case $p > 2$ because the case $p = 2$ is quite simple and does not lead to new results.

We focus particularly on the case when F contains a primitive p th root of unity. In fact, this paper is a continuation of [MS] wherein, under this hypothesis, we classified $\mathbb{F}_p[\text{Gal}(K/F)]$ -modules K^n/K^{n^p} using arithmetic invariants attached to K/F , and the investigations there were motivated by the embedding problems solved in this paper. When F is not of this type, we employ a descent argument in the case

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Embedding Problems And Galois Modules

Tommy Bonnesen, Werner Fenchel



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Embedding Problems and Galois Modules Jan Brinkhuis, 1981
Roggenkamp, 2006-11-14 With contributions by numerous experts
Wladyslaw Narkiewicz, 2013-06-29 The aim of this book is to present an exposition of the theory of algebraic numbers excluding class field theory and its consequences There are many ways to develop this subject the latest trend is to neglect the classical Dedekind theory of ideals in favour of local methods However for numerical computations necessary for applications of algebraic numbers to other areas of number theory the old approach seems more suitable although its exposition is obviously longer On the other hand the local approach is more powerful for analytical purposes as demonstrated in Tate's thesis Thus the author has tried to reconcile the two approaches presenting a self contained exposition of the classical standpoint in the first four chapters and then turning to local methods In the first chapter we present the necessary tools from the theory of Dedekind domains and valuation theory including the structure of finitely generated modules over Dedekind domains In Chapters 2 3 and 4 the classical theory of algebraic numbers is developed Chapter 5 contains the fundamental notions of the theory of p -adic fields and Chapter 6 brings their applications to the study of algebraic number fields We include here Shafarevich's proof of the Kronecker Weber theorem and also the main properties of adèles and ideles

Galois Module Structure of Algebraic Integers Albrecht Fröhlich, 1983
Arne Ledet, This monograph is concerned with Galois theoretical embedding problems of so called Brauer type with a focus on 2 groups and on finding explicit criteria for solvability and explicit constructions of the solutions Before considering questions of reducing the embedding problems and reformulating the solvability criteria the author provides the necessary theory of Brauer groups group cohomology and quadratic forms The book will be suitable for students seeking an introduction to embedding problems and inverse Galois theory It will also be a useful reference for researchers in the field

Publications mathématiques de Besançon N° 1/2010 Patrick Hild, 2010-03
Christian Meyer, 2005 The main subject of this book is the connection between Calabi Yau threefolds and modular forms The book presents the general theory and brings together the known results It studies hundreds of new examples of rigid and non rigid modular Calabi Yau threefolds and correspondences between them Conjectures about the possible levels of modular forms connected with Calabi Yau threefolds are presented Tables of newforms of weight four and large levels are compiled and included in the appendix Jaquette
Ergebnisse der Mathematik und ihrer Grenzgebiete Tommy Bonnesen, Werner Fenchel, 1983
Elementary and Analytic Theory of Algebraic Numbers Wladyslaw Narkiewicz, 1990
Mathematical Reviews, 2001
Manuscripta Mathematica, 1992
□□□□□□, 1985
Bulletin of the American Mathematical Society, 2003
Bulletin (new Series) of the American Mathematical Society, 2007
Reviews in Number Theory, 1984-96, 1997 These six volumes include approximately 20 000 reviews of items in number theory that appeared in

Mathematical Reviews between 1984 and 1996 This is the third such set of volumes in number theory The first was edited by W J LeVeque and included reviews from 1940 1972 the second was edited by R K Guy and appeared in 1984 Groupes de Galois Arithmétiques Et Différentiels Daniel Bertrand, Pierre Dèbes, 2006 On March 8 13 2004 a meeting was organized at the Luminy CIRM France on arithmetic and differential Galois groups reflecting the growing interactions between the two theories The present volume contains the proceedings of this conference It covers the following themes moduli spaces of curves of coverings of connexions including the recent developments on modular towers the arithmetic of coverings and of differential equations fields of definition descent theory fundamental groups the inverse problems and methods of deformation and the algorithmic aspects of the theories with explicit computations or realizations of Galois groups

Reviews in Number Theory 1973-83 Richard K. Guy, 1984 Journées arithmétiques, 1982 **St. Petersburg Mathematical Journal**, 2001 **Abstracts of Papers Presented to the American Mathematical Society** American Mathematical Society, 2006

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In a digital era where connections and knowledge reign supreme, the enchanting power of language has are more apparent than ever. Its ability to stir emotions, provoke thought, and instigate transformation is really remarkable. This extraordinary book, aptly titled "**Embedding Problems And Galois Modules**," published by a highly acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound impact on our existence. Throughout this critique, we will delve into the book is central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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