ON SOLVING RELATIVE NORM EQUATIONS IN ALGEBRAIC NUMBER FIELDS

C. FIEKER, A. JURK, AND M. POHST

Abstract. Let $\mathbb{Q} \subseteq \mathcal{E} \subseteq \mathcal{F}$ be algebraic number fields and $M \subset \mathcal{F}$ a free $o_{\mathcal{E}}$-module. We prove a theorem which enables us to determine whether a given relative norm equation of the form $| N_{\mathcal{F}/\mathcal{E}}(\eta)| = |\theta|$ has any solutions $\eta \in M$ at all and, if so, to compute a complete set of nonassociate solutions. Finally we formulate an algorithm using this theorem, consider its algebraic complexity and give some examples.

1991 *Mathematics Subject Classification.* Primary 11Y40.
Key words and phrases. Algebraic number theory, norm equations, relative norm equations, relative extensions

C. Fieker: Fachbereich 3, Mathematik MA 8–1, Technische Universität Berlin, Strasse des 17. Juni 136, D-10623 Berlin, F.R.G.
E-mail address: fieker@math.tu-berlin.de

A. Jurk: Weingartstr. 42, D-41464 Neuss, F.R.G.

M. Pohst: Fachbereich 3, Mathematik MA 8–1, Technische Universität Berlin, Strasse des 17. Juni 136, D-10623 Berlin, F.R.G.
E-mail address: pohst@math.tu-berlin.de