1067-11-1171 **Ken Dutch*** (ken.dutch@eku.edu), Department of Mathematics and Statistics, Eastern Kentucky University, Richmond, KY 40475, and **Peter Johnson** (johnspd@auburn.edu), **Christopher Maier** (8maier@gmail.com) and **Jordan Paschke** (jpaschke@u.rochester.edu).
A Frobenius Problem for the Ring of Integers in a Number Field.

The Frobenius coin problem seeks to find for any set of coins with mutually relatively prime integer denominations the maximal integer price which is not expressible as a non-negative integer linear combination of the coins. Equivalently the problem can be recast as finding the maximal positively-directed ray in the integers which is covered by non-negative integer linear combinations of the coin values. In the integer ring of a number field, we investigate an extension of the Frobenius problem where the "coins" are now algebraic integers residing the closed first quadrant, "non-negative integer linear combinations" are extended to include any algebraic integer coefficients which are themselves expressible as non-negative linear combinations of a selected first quadrant basis for the field extension, and "rays" are now translates of the integer portion of the smallest convex cone spanning all possible "non-negative integer linear combinations" of the "coins". We show that the set of maximal covered "rays" is non-empty, but finite, for number fields containing no irrational real number. We also provide explicit constructions for the maximal rays for several coin sets in the Gaussian integers. (Received September 19, 2010)