1106-11-2279 **Alan Koch*** (akoch@agnesscott.edu), Box 1092, Agnes Scott College, 141 E. College Ave., Decatur, GA 30033. *Generalized integral Hopf-Galois module structure in characteristic p.*

Let $L$ be a finite, purely inseparable, totally ramified extension of a discrete valuation field $K$ of characteristic $p$, $[L:K] = p^n > p$. Let $\mathfrak{O}_L$ be the valuation ring of $L$, and let $\mathfrak{P}_L \subset \mathfrak{O}_L$ be its maximal ideal. There are numerous commutative, cocommutative $K$-Hopf algebras $H$ which act on $L$ in such a way as to make $L/K$ a Hopf-Galois extension. We will construct a collection of such Hopf algebras, and for each we will investigate the structure of the fractional ideals of $\mathfrak{O}_L$ as modules over certain $\mathfrak{O}_L$-orders in the Hopf algebra. Explicitly, for each $H$ in our collection, for $m \in \mathbb{Z}$ we define the associated order of $\mathfrak{P}_L^m$ in $H$ to be $\mathfrak{A}_H(m) = \{h \in H : h\mathfrak{P}_L^m \subseteq \mathfrak{P}_L^m\}$; we will give a numerical criterion which will determine whether $\mathfrak{P}_L^m$ is a free $\mathfrak{A}_H(m)$-module. In particular, one can always choose an action of $H$ on $L$ such that $\mathfrak{O}_L$ is a free $\mathfrak{A}_H(0)$-module. (Received September 16, 2014)