Meeting: 1004, Bowling Green, Kentucky, SS 10A, Special Session on Hopf Algebras and Related Topics

1004-16-168 **Stefaan Caenepeel*** (scaenepe@vub.ac.be), Pleinlaan 2, 1050 Brussels, Belgium, and **Thomas Guédénon**. *Fully bounded noetherian rings and Frobenius extensions.*

Let $i: A \to R$ be a ring morphism, and $\chi: R \to A$ a right R-linear map with $\chi(\chi(r)s) = \chi(rs)$ and $\chi(1_R) = 1_A$. We then say that A is an R-ring with a right grouplike character. A is a right R-module, with action $ar = \chi(ar)$. $B = A^R = \{b \in A \mid b\chi(r) = \chi(br),$ for all $r \in R$ is called the subring of invariants. Our main result states that, if A is quasi-projective as a right R-module, and R/A is Frobenius, then A is right FBN if and only if B is right FBN and A is right noetherian. If R/A is Frobenius, then we can define a trace map $\mathrm{tr}: A \to B$. Then A is projective as a right R-module if and only if there exists an element in A with trace 1. Our result can be extended to the situation where R/A is I-Frobenius, with I a strict Morita context connecting A to itself.
The results can be applied in the following situations: $R = A\#H$, where H is a finitely generated projective Hopf algebra and A a left H-module algebra, giving existing results of García and del Río and of Dăscălescu, Kelarev and Torrecillas; $R = S^{\mathrm{op}} \otimes A$, with S a Frobenius algebra, and $j: S \to A$ an algebra morphism; $R = {}^*\mathcal{C}$, with $\mathcal{C}$ an A-coring. (Received January 24, 2005)