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Miodrag C Iovanov* (yovanov@gmail.com). *Frobenius-Artin Algebras and Infinite Linear Codes.*

We show that Frobenius rings that are at the same time Artin algebras have characterizations that extend and unify well known results of Nakayama for algebras over fields, and some recent results for finite Frobenius rings [T.Honold, Arch. Math (Basel) 76, no. 6 (2001)], and which entitles one to call such algebras Frobenius-Artin algebras. On the other hand, finite Frobenius rings have raised interest due to connections with coding theory [J.A.Wood, Proc. AMS 136, no. 2 (2008)]. It has been recently shown that they are characterized as rings for which linear codes have the extension property [J.A.Wood, Amer. J. Math 121, no.3 (1999)]. We generalize this to arbitrary rings, and show that in the infinite case, the categorical properties of Frobenius rings are captured by this extension property. Namely, we show that a ring has the extension property for linear codes if and only if it is the product of a finite Frobenius ring and a quasi-Frobenius ring with no finite representations (modules). We give two proofs of this, one that uses measure theory and compact groups, and another combinatorial one. (Received February 11, 2013)