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Boris Adamczewski and **Jason P Bell***, Department of Mathematics, 8888 University Dr., Burnaby, BC V5A 1S6, Canada. *The noetherian property for naive blow-up algebras in positive characteristic.*

In this paper, we consider naive blow-up algebras, introduced by Keeler, Rogalski, and Stafford, in positive characteristic. These algebras are produced using geometric data, and it was shown by Keeler, Rogalski, and Stafford showed that to such rings, one can associate an irreducible projective variety X , a point $x \in X$, and an automorphism σ of X and that such an algebra is noetherian precisely when the orbit of x under X is infinite and has the property that every infinite subset is dense (i.e., the orbit is critically dense). In characteristic 0, Bell, Ghioca, and Tucker showed that if some infinite subset of the orbit fails to be dense, then there is some iterate τ of σ such that that the orbit of x under τ fails to be dense. In characteristic $p > 0$, additional pathologies are known to occur. We show that for many classes of varieties, if some infinite subset of the orbit fails to be dense, then there is a large “automatic” subset S of \mathbb{Z} (generated by a finite-state automaton) such that the subset of the orbit corresponding to S is not Zariski dense. This show how this allows one to effectively determine whether a naive blow-up algebra in positive characteristic is noetherian. (Received August 27, 2011)