1116-11-237 **Patrick Ingram**, Mathematics Department, Colorado State University, Fort Collins, CO 80523, **Joseph H Silverman***, Mathematics Department, Brown University, 151 Thayer Street, Providence, RI 02912, and **Katherine Stange**, Mathematics Department, University of Colorado, Boulder, CO 80309. *Divisibility sequences associated to higher dimensional algebraic groups.* Preliminary report.

Classical divisibility sequences such as $a^n - b^n$, Fibonacci and Lucas sequences, and elliptic divisibility sequences, are associated to multiples of a rational point P on a one-dimensional algebraic group $\mathcal{G}$. These divisibility sequences tend to grow rapidly, and their mod p and p-adic behaviors are quite interesting. Intrinsically they may be described as the arithmetic intersection $W_n = (nP)\cdot\mathcal{O}$ on some model of $\mathcal{G}$ over $\mathrm{Spec}(\mathbb{Z})$. Replacing $\mathcal{G}$ with a higher dimensional algebraic group again leads to interesting divisibility sequences $W_n = (nP)\cdot\mathcal{O}$, but these W_n tend to be quite small. We consider an alternative generalization in which P is replaced by an effective divisor $D \in \mathrm{Div}(\mathcal{G})$. We will discuss generalized divisibility properties, growth properties, and mod p and p-adic properties of the resulting sequences $W_n = (n_*D)\cdot\mathcal{O}$, concentrating on the case that $\mathcal{G} = \mathbb{G}_m^N$ is a torus. (Received August 16, 2015)