1163-13-1232 **Austin Antonoiu**, **Ranthony A.C. Edmonds*** (edmonds.110@osu.edu), **Bethany Kubik**, **Christopher O'Neill** and **Shannon Talbott**. *On Atomic Density of Numerical Semigroup Algebras.*

A numerical semigroup S is a cofinite, additively-closed subset of the nonnegative integers that contains 0. In this paper, we initiate the study of atomic density, an asymptotic measure of the proportion of irreducible elements in a given ring or semigroup, for semigroup algebras. For a fixed field $\mathbb{F}$ an a numerical semigroup S, the numerical semigroup algebra $\mathbb{F}[S]$ is the subring of $\mathbb{F}[x]$ consisting only of terms of the form x^a for $a \in S$.

It is known that the atomic density of the polynomial ring $\mathbb{F}_q[x]$ is zero for any finite field $\mathbb{F}_q$. We prove that the numerical semigroup algebra $\mathbb{F}_q[S]$ also has atomic density zero for any numerical semigroup S. We also examine the particular algebra $\mathbb{F}_2[x^2, x^3]$ in more detail, providing a bound on the rate of convergence of the atomic density as well as a counting formula for irreducible polynomials using Möbius inversion, comparable to the formula for irreducible polynomials over a finite field $\mathbb{F}_q$. (Received September 15, 2020)