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# RATIONAL POINTS OF LATTICE IDEALS ON A TORIC VARIETY AND TORIC CODES

Mesut Şahin

Hacettepe University

## Abstract

We begin by introducing basic notions about algebraic geometric codes obtained from evaluating rational functions on  $K$ -rational points of a toric variety, where  $K$  is a field with  $q$  elements. Then, we get more technical and exhibit some results on computing the number of  $K$ -rational points cut out by a lattice ideal via Smith normal form of the matrix whose columns constitute a basis of the lattice. We also share a Nullstellensatz type theorem over  $K$  establishing a one to one correspondence between subgroups of the dense split torus and certain homogeneous lattice ideals. Time permitting, we give formulas for the main parameters of toric codes on subgroups of the torus of Hirzebruch surfaces.

**Date :** Friday, March 4, 2022

**Time:** 17:00

**Place:** Boğaziçi University, South Campus & Zoom