



The Hong Kong University of Science and Technology

Department of Mathematics

MPhil THESIS EXAMINATION

Graded Sheaves in Geometric Representation Theory

By

Mr. Wenwei LIU

ABSTRACT

The recently constructed graded ℓ -adic sheaf theory by Ho-Li provides a uniform construction of “mixed version” in the sense of Beilinson-Ginzburg-Soergel which works for any Artin stacks of finite type over $\overline{\mathbb{F}}_q$. In this paper, we explore some applications of graded sheaves in geometric representation theory. In particular, we prove a graded Springer correspondence which is a more streamlined proof of the result by Rider.

Moreover, we discuss the use of graded sheaves in providing a graded derived geometric Satake equivalence using Soergel’s method. This part is still a work in progress.

Date : 8 August 2024, Thursday

Time : 4:00 p.m.

Venue : Room 5501 (Lifts 25-26)

Thesis Examination Committee

Chairman : Prof. Ivan Chi Ho IP, MATH /HKUST

Thesis Supervisor : Prof. Quoc HO, MATH/HKUST

Member : Prof. Eric Paul MARBERG, MATH/HKUST

(Open to all faculty and students)

The student's thesis is now being displayed on the reception counter in the General Administration Office (Room 3461).