



The Hong Kong University of Science and Technology

Department of Mathematics

MPhil THESIS EXAMINATION

**Investigation on the Structural Theory of
Elliptic Quantum Groups**

By

Mr. Yunhe LI

ABSTRACT

In this thesis, we investigate a new type of elliptic quantum affine algebra $U_{q,p}(\widehat{\mathfrak{sl}}_2)$ developed by Hitoshi Konno. We first provide detailed proofs for some important properties listed on Konno's papers. We then compare it with Felder's elliptic algebra $E_{\tau,\eta}(\mathfrak{sl}_2)$ and find some similar results on Konno's type. Finally we study the degeneration limit of $U_{q,p}(\widehat{\mathfrak{sl}}_2)$ when $q \rightarrow 1$ by considering another elliptic algebra $\mathcal{A}_{q,p}(\widehat{\mathfrak{sl}}_2)$ and its degeneration limit $\mathcal{A}_{\hbar,\eta}(\widehat{\mathfrak{sl}}_2)$.

Date : 10 July 2023, Monday

Time : 3:00 p.m.

Venue : Room 4472 (Lifts 25/26)

Thesis Examination Committee

Chairman : Prof. Weiping LI, MATH /HKUST

Thesis Supervisor : Prof. Ivan Chi Ho IP, MATH/HKUST

Member : Prof. Yik Man CHIANG, 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).