

# SCMS Seminar



## SLOPES FOR HIGHER RANK ARTIN--SCHREIER--WITT TOWERS

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UCI

**Time:** 14:00 p.m.-16:00 p.m., Friday, August 26, 2016

**Venue:** Room 2213, East Guanghua Tower (Main), Fudan University

### Abstract:

We fix a monic polynomial  $\bar{f}(x) \in \mathbb{F}_q[x]$  over a finite field of characteristic  $p$ , and consider the  $\mathbb{Z}_p$ -Artin--Schreier--Witt tower defined by  $\bar{f}(x)$ ; this is a tower of curves  $\cdots \rightarrow C_m \rightarrow C_{m-1} \rightarrow \cdots \rightarrow C_0 = \mathbb{A}^1$ , whose Galois group is canonically isomorphic to  $\mathbb{Z}_p$ , the degree  $l$  unramified extension of  $\mathbb{Z}_p$ , which is abstractly isomorphic to  $(\mathbb{Z}_p)^l$  as a topological group.

We study the Newton slopes of zeta functions of this tower of curves. This reduces to the study of the Newton slopes of L-functions associated to characters of the Galois group of this tower. We prove that, when the conductor of the character is large enough, the Newton slopes of the L-function

asymptotically form a finite union of arithmetic progressions. As a corollary, we prove the spectral halo property of the spectral variety associated to the  $\mathbb{Z}_p$ -Artin--Schreier--Witt tower. This extends the main result in [DWX] from rank one case  $l=1$  to the higher rank case  $l \geq 1$ .