



THE UNIVERSITY OF
CHICAGO

Department of Statistics

DISSERTATION PRESENTATION AND DEFENSE

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On Multiple-Paths Schramm-Loewner Evolution

Friday, July 13, 2018, at 1:00 PM
Jones 304, 5747 S. Ellis Avenue

ABSTRACT

In this thesis, we study the properties of multiple-paths Schramm-Loewner Evolution (SLE_K). One of the main objectives is to study this process in multiply-connected domains, which requires discussing single path SLE_K in such domains first.

In chapter 1, we give a review of SLE_K in simply connected domains. In addition, we discuss certain deterministic estimates using techniques from complex analysis. The main tools are Koebe-1/4 theorem and the distortion estimates. In Chapter 2, we discuss multiple-paths SLE_K in simply connected domains. In particular, we give a definition using the Brownian loop measure and show that the partition function is smooth. This chapter is based on a joint work with Gregory Lawler [17].

SLE_K in multiply-connected domains is discussed in Chapter 3. In this chapter, Brownian loop measure is used to define SLE_K by describing particular Radon-Nikodym derivatives. In addition, we give an argument comparing SLE_K in annuli and radial SLE_K . In Chapter 4, we define multiple-paths SLE_K in annuli and prove that its partition function is smooth. In Chapter 5, we use this definition to show that two-sided SLE_K can be estimated by two SLE_K paths in annuli.