Multiple SLEs and Dyson Brownian motion

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Multiple SLEs come naturally as the scaling limit of multiple interfaces in 2-dimensional statistical physics models. Dyson Brownian motion usually describes the movement of trajectory of independent Brownian motions under mutual repulsion. In this talk, we will describe the connection between multiple SLEs and Dyson Brownian motion. The talk has two parts.

In the first part, we take critical FK-Ising model as an example and explain the emergence of multiple SLEs. We give the connection probabilities of multiple SLEs. Such probabilities are related to solutions to BPZ equations in conformal field theory.

In the second part, we explain the connection between multiple SLEs and Dyson Brownian motion. It turns out that, under proper time-parameterization, and conditioning on a rare event, the driving function of multiple SLEs becomes Dyson Brownian motion. Using such connection, we may translate estimates on Dyson Brownian motion to estimates on multiple SLEs.