

## Chilean Probability Seminar

**Orador:** Amal Taarabt (Pontificia Universidad Católica de Chile).

**Título:** Dirac operators in a decaying random environment: dynamics and spectral statistics.

**Resumen:** We consider a one-dimensional discrete Dirac operator in a potential given by a family of i.i.d. random variables modulated by a decreasing envelope. In [1], we showed that these models exhibit a rich phase diagram in terms of their spectrum as a function of the rate of decay of the random potential, where the spectrum of the operator

- is absolutely continuous for fast decay,
- is pure point for slow decay,
- presents a spectral transition for critical decay.

We show dynamical localization in the sub-critical region by means of the fractional moments method and provide control on the eigenfunctions. We studied spectral statistics in [2], we show that, in the fast decay case, the rescaled spectrum of the operator converges to the clock process while for critical decay, it converges to the Schrödinger point process. In this way, we recovered the results of Kritchevski, Valkó and Virag established for the Anderson model. Our proof is based on the scaling limit of the Prüfer transform associated with the system and uses the monotonicity to deduce the convergence. In the slow decay, the spectral statistics are expected to be given by a Poisson process.

[1] O. Bourget, G. R. Moreno Flores, A. Taarabt, One-dimensional Discrete Dirac Operators in a Decaying Random Potential I: Spectrum and Dynamics, Mathematical Physics, Analysis and Geometry, Volume 23, Article number 20, 2020.

[2] G. R. Moreno Flores, A. Taarabt, One-dimensional Discrete Dirac Operators in a Decaying Random Potential II: Clock, Schrödinger and Sine statistics, submitted.

El enlace para conectarse al seminario es:

Unirse a la reunión Zoom

<https://reuna.zoom.us/j/84521834914?pwd=OTZ6Y0NWMM3pYTGtTbEt3c0luTG96UT09>

ID de reunión: 845 2183 4914

Código de acceso: 997973

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**Este tendrá lugar el Miércoles 11 de Octubre 2023 a las 16:30 hrs modalidad híbrida en el edificio Rolando Chuaqui (sala a confirmar) del Campus San Joaquín de la Pontificia Universidad Católica de Chile y por Zoom.**

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