

# SEMPARIS – Séminaires en région parisienne

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## Séminaire commun LPTENS/LPTHE

**Mardi 28 Janvier 2020, 11 :30**

LPTENS, LPENS Scherk library

Domaines : hep-th

Titre : *Free Fermion Entanglement and Time and Band Limiting*

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Résumé : *We shall discuss entanglement in open finite free-Fermion chains associated with families of discrete orthogonal polynomials and present a simple construction for a tridiagonal matrix  $T$  that commutes with the hopping matrix for the entanglement Hamiltonian  $H$ . We shall rely on the notion of algebraic Heun operator attached to bispectral problems, and the parallel between entanglement studies and the theory of time and band limiting. As examples, we will examine Fermionic chains related to the Chebychev and Krawtchouk polynomials. For the former case, which corresponds to a homogeneous chain, the outcome of the construction coincides with recent results of Eisler and Peschel; the latter case yields commuting operators for a particular inhomogeneous chain. Since  $T$  is tridiagonal and non-degenerate, it can be readily diagonalized numerically, which in turn can be used to calculate the spectrum of  $H$ , and therefore the entanglement entropy.*

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