

AN INTERACTING FREE FOCK SPACE AND THE ARCSINE LAW

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Abstract: Motivated by previous investigations of the *interacting* central limit theorem for the quantum Bernoulli process and of the stochastic limit of quantum electrodynamics, we construct some examples of interacting free Fock spaces which realize the first non-Gaussian (neither free, nor Bose nor Fermi or q -deformed) examples of quantum independent increment processes: the mixed momenta are not expressible as products of pair correlations. We give general rules to compute the vacuum expectation of products of creation and annihilation operators. By these rules, any moment of field operator becomes computable. We also obtain the precise expression of the distribution of the field operator. This is *not* the Wigner semi-elliptical law (even if we start from the free Fock space) but in some sense its reciprocal, that is the *arcsine* law.

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