

# GENERALIZED FOCK SPACES AND SECOND QUANTIZATION AS EXAMPLES OF HYPERCONTRACTIVE SEMIGROUPS

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In my talk we will consider the following topics:

- (1) Generalized Fock spaces  $\mathcal{F}_T(\mathcal{H})$  for real contraction  $T$  on a real Hilbert space  $\mathcal{H}$ .
- (2) Anyonic Fock spaces and type  $B$ -Fock spaces.
- (3) Second functor quantization  $\Gamma_T(S)$  from the von Neumann algebra  $G_T(\mathcal{H})$  generalized by  $T$ -Gaussian operators  $G(f) = a(f) + a^+(f)$ , where  $f$  is in a real Hilbert space  $\mathcal{H}$ .
- (4) If  $S = e^{-t}Id$ , we get so called generalized Ornstein-Uhlenbeck semigroup  $U_t = \Gamma_T(S)$  and in many cases of  $T$  we have hypercontractivity and ultracontractivity, i.e.  $U_t$  maps  $L^2$  into  $L^\infty$ , where here  $L^2$  is the Fock space  $\mathcal{F}_T(\mathcal{H})$  and  $L^\infty = G_T(\mathcal{H})$ .

The subject of the talk is taken from the papers together with W. Ejsmont, T. Hasebe, E. Lytvynov, I. Rodionova, Q. Xu and J. Wysoczański.

## REFERENCES

- [1] M. Bożejko and W. Bożejko. Generalized Gaussian processes and relations with random matrices and positive definite functions on permutation groups. *Infin. Dimens. Anal. Quantum Probab. Relat. Top.*, 18(3):1550020, 19, 2015.
- [2] M. Bożejko, W. Ejsmont, and T. Hasebe. Fock space associated to Coxeter groups of type B. *J. Funct. Anal.*, 269(6):1769–1795, 2015.
- [3] M. Bożejko, E. Lytvynov, and J. Wysoczański. Noncommutative Lévy processes for generalized (particularly anyon) statistics. *Comm. Math. Phys.*, 313(2):535–569, 2012.
- [4] M. Bożejko, E. V. Litvinov, and I. V. Rodionova. An extended anyon Fock space and non-commutative Meixner-type orthogonal polynomials in the infinite-dimensional case. *Uspekhi Mat. Nauk*, 70(5(425)):75–120, 2015.