# Analysis of orderings of partitions in the context of fractional quantum Hall effect

**Bartosz Kuśmierz and Arkadiusz Wójs**

*Wrocław University of Technology, wybrzeże Wyspiańskiego 27, 50-370 Wrocław, Poland*

Fractional quantum Hall effect is still highly examined remarkable behavior of electron in solid state. Among many approaches to this problem we focus on based on general trial wave functions, generated by the k-body short-repulsion. Such series, among the Laughlin state (k=2) consists of the Moore-Read „Pfaffian" (k=3) state, believed to be a good description of $\nu = 5/2$ state and Read-Rezayi parafermion ground states (k=4), witch is considered as a description of $\nu = 13/5$ state. Those wave functions are associated to the symmetric functions theory. Connections between the symmetric polynomials theory and quantum Hall effect has been discussed in a series of papers [1-4].

This poster is devoted to the analysis of one aspect of the symmetric polynomials theory in a physics of Hall systems i.e. role of ordering of the partitions. Partition is a sequence of nonnegative integer numbers. Spinless fermionic wave function of a fractional quantum Hall state can be expanded in the Slater determinant basis indexed by partitions. Symmetric polynomials theory suggests that partitions should be ordered according to the reverse lexicographic order, which corresponds to the natural order. Such ordering of a basis reveals that coefficients of certain spinless FQH states are nonzero only for basis functions indexed by the partitions smaller in natural order than certain partition. We examine whether such property can be of use in examination of other fractional quantum Hall states.

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[2] B. A. Bernevig and F. D. M. Haldane, Phys. Rev. Lett. **100**, 246802 (2008).
[3] B. A. Bernevig and F. D. M. Haldane, Phys. Rev. Lett. **102**, 066802 (2009).
[4] B. Kuśmierz, Y.-H. Wu, and A. Wójs, Acta Phys. Polon. A **126**, 1134 (2014).