

Generalized Gross-Neveu Universality Class with Non-abelian Symmetry

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We use the large N expansion to compute d -dimensional critical exponents at $O(1/N^3)$ for a generalization of the Gross-Neveu Yukawa universality class that includes a non-abelian symmetry. Specific groups correspond to certain phase transitions in condensed matter physics such as graphene. The effect of the non-abelian symmetry on the exponents is evidenced by the appearance of rank 4 Casimirs in the higher order $1/N$ analytic corrections. These in effect tag the light-by-light diagrams. The main benefit of the final expressions for the exponents is that one can recover previous results for a variety of universality classes in various limits.

Orateur: Prof. GRACEY, John (University of Liverpool)