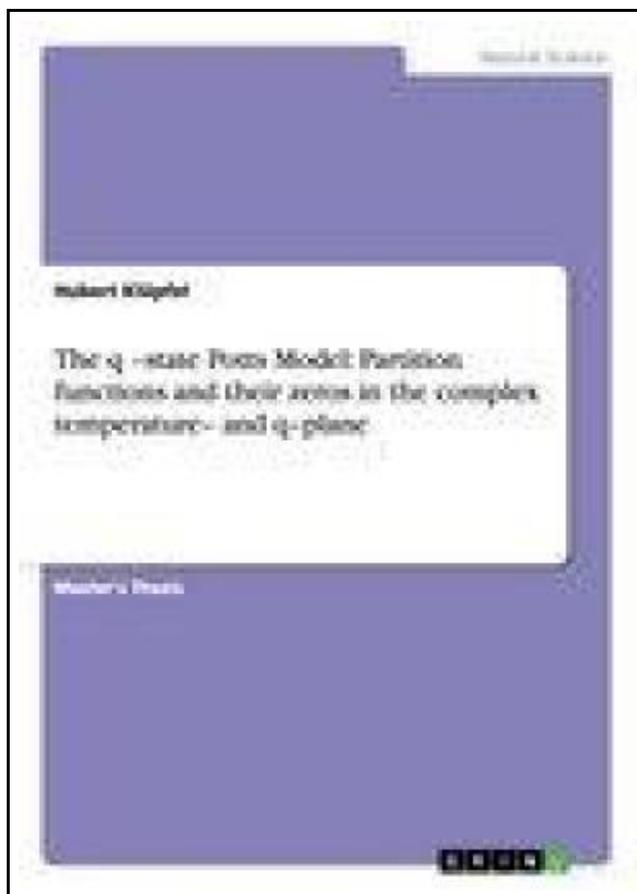


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GRIN Verlag Mrz 2014, 2014. Taschenbuch. Book Condition: Neu. 210x148x9 mm. This item is printed on demand - Print on Demand Neuware - Master's Thesis from the year 1999 in the subject Physics - Theoretical Physics, grade: 1,0, State University of New York at Stony Brook (Institute for Theoretical Physics), course: -, language: English, abstract: In this thesis results on the Partition function  $Z_G(T, q)$  for the  $q$  state Potts Model on finite polygonal lattices  $G$  are presented. These are polynomials in  $a e^J$  and  $q$ . The first step is to calculate all the coefficients of  $Z_G(a, q)$  using a transfer matrix method. The only points of non analyticity are the zeros of the partition function; in the thermodynamic limit the complex temperature zeros form a continuous curve  $B$  via coalescence. This is the locus where the free energy is non analytic. The zeros of  $Z(a, q)$  in the complex  $q$  plane for finite  $a$  and in the complex  $a$  plane for integer and non integer values of  $q$  are plotted. For  $a = 0$  the partition function reduces to the chromatic polynomial  $P_G(q)$  of the graph and the zeros are called chromatic zeros. The behavior of those zeros as  $a$  increases from zero is investigated. As for complex temperature the zeros in  $q$  form a continuous curve in the thermodynamic limit. This is the locus where the limiting function  $W_G(q) = \lim_n P_G(q)^{1/n}$  is non analytic.  $W_G(q)$  is the ground state degeneracy and is connected to the ground state entropy via  $S_0(G, q) = k_B \ln(W_G(q))$ . Thus the characteristics of the zeros of  $q$  and  $a$  for finite lattices help to understand the properties of the model in the thermodynamic limit. 128 pp. Englisch.

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