Critical point of phase transitions of fractional order at Super-conductors VLADIMIR UDODOV, Katanov Khakas State University, KATANOV KHAKAS STATE UNIVERSITY TEAM — This paper describes the behavior of thermodynamic values superconducting transition at temperature, tending to absolute zero. Using the thermodynamic arguments we demonstrate that superconductors can undergo third, fourth-, fifth- and higher (including fractional) order phase transitions (PT's) within the meaning of Baxter [1] (or Ehrenfest) as the temperature tending to zero. It is proved that the order of PT can be any real (fractional) number at some interval (from 2 to 8). It is established relation between critical exponent of specific heat and critical magnetic field for superconductor as the temperature tending to zero. It is proved that Ehrenfest classification of phase transitions does not work with a zero critical temperature. Note that the results are valid only in the case of thermodynamic equilibrium, making it difficult to reach experimentally at very low temperatures.

[1] Baxter R.J. Exactly Solved Models In Statistical Mechanics. – London, New York, Sydney, Tokyo, Toronto. – Academic press. – 1982.

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