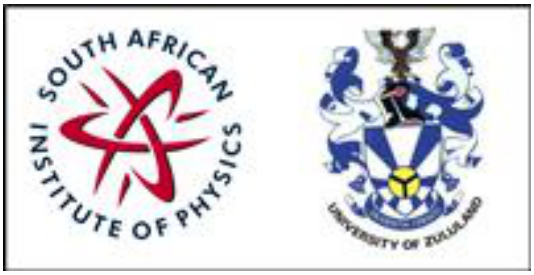

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The determination of critical behavior of ferromagnetic CeCuGe using magnetocaloric effect

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Abstract content
   (Max 300 words)

Critical behavior of magnetic systems associated with a second order phase transition is of general interest in condensed matter physics as a tool with which to study universal behavior across a wide range of magnetic systems. Typically a specific universality class is characterized by a set of critical exponents, the latter determining the type of divergences occurring in thermo-magnetic quantities (or their derivatives) as the phase transition temperature is approached. Here we present results obtained from specific heat and magnetization measurements of CeCuGe. It has been established that this compound exhibits an anomaly associated with ferromagnetic ordering at T_C = 10 K [1]. The associated critical exponents have been determined in this study employing Arrott plots technique [2, 3]. This technique yields the location of the phase transition temperature as well as the values of the critical exponents, the latter relegating CeCuGe to a class of mean field ferromagnets. An independent analysis of these results in terms of the magnetocaloric effect (MCE) are presented. The MCE is defined as an isothermal change in entropy upon magnetization, or alternatively, an isentropic change in sample temperature upon the removal of an externally applied magnetic field. Of interest is the scaling behavior of the isothermal MCE at the phase transition temperature with applied field, which has been shown to occur in ferromagnetic alloys [4]. Informed by the Arrott-plot analysis, we compare the behavior of the MCE with the predicted scaling behavior of a mean field ferromagnet.

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Primary author: Ms SONDEZI, Buyi (University of Johannesburg)

Co-authors: Prof. STRYDOM, Andre (University of Johannesburg); Mr SNYMAN, Jasper (University of Johannesburg)

Presenter: Ms SONDEZI, Buyi (University of Johannesburg)

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