

## COMPUTATION OF THE MAGNETIC CRITICAL POINT EXPONENT ( $\beta$ ) OF FERROMAGNETS USING 1 – DIMENSIONAL ISING MODEL

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### ABSTRACT

The magnetic critical point exponent ( $\beta$ ) of one-dimensional Ising ferromagnetism was calculated for one-break configurations. In the limit of the applied magnetic field ( $H$ ) approaches zero and the number of spins ( $N$ ) approach infinity, the non – zero magnetization per particle was obtained using Fe, Ni,  $\text{CrBr}_3$  and EuS materials as case studies.

The calculated values of magnetic critical point exponent ( $\beta$ ) for Fe, Ni,  $\text{CrBr}_3$  and EuS at  $N = 100$  are  $0.340 \pm 0.042$ ;  $0.420 \pm 0.070$ ;  $0.368 \pm 0.005$  and  $0.330 \pm 0.015$  respectively.

According to Stanely [13], the range of values for magnetic exponent ( $\beta$ ) is 0.3 – 0.5, which is in agreement with the results obtained. The experimental values of critical point exponent ( $\beta$ ) of ferromagnetic is presented in Table 10; and is adopted from Itzykson and Drouffe [10].

**KEYWORDS:** Magnetic Critical Point Exponent, Magnetism, Ferromagnetic Materials