

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Scaling of logarithmic quantum fidelity in the Lipkin-Meshkov-Glick model**<sup>1</sup> CHING YEE LEUNG, HO-MAN KWOK, SHI-JIAN GU, HAI-QING LIN, Department of Physics, The Chinese University of Hong Kong — The quantum fidelity is used to describe quantum phase transitions in many works. As the classical expression of logarithmic fidelity is shown to be an extensive value, it was suggested that the logarithmic fidelity can be averaged over the system size and named as fidelity per site. However, illustrated by the anisotropic Lipkin-Meshkov-Glick model, which exhibits different scaling behaviour in different phases, we show that the logarithmic fidelity in the ground state of the model scales like  $N$  in the symmetry-broken phase and  $N^0$  in the polarizing phase. It is suggested to be a pure quantum effect and generalization of fidelity per site is proposed.

<sup>1</sup>This work is supported by the Earmarked Grant for Research from the Research Grants Council (RGC) of the HKSAR, China (Project N\_CUHK204/05).

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Date submitted: 25 Nov 2008

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