

Abstract Submitted  
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**Entanglement Entropy in Critical Harmonic Chains with Even Dynamical Exponents** LAYLA HORMOZI, Joint Quantum Institute, NIST and University of Maryland, NICK BONESTEEL, KUN YANG, Department of Physics and NHMFL, Florida State University — We study the behavior of the entanglement entropy in a chain of coupled harmonic oscillators at the critical regime and in the absence of conformal symmetry. We consider a specific class of the so-called “squared” interactions [1], namely interactions leading to the dispersion  $\omega_k = (2\text{Sin}(k/2))^z$  with even dynamical exponent,  $z$ , in which up to the  $z^{\text{th}}$  nearest neighbors are coupled. Similar to the conformally symmetric case, we find a logarithmic scaling for the entanglement entropy, with a coefficient that can be calculated analytically and depends only on  $z$ .

[1] M. B. Plenio, J. Eisert, J. Dreißig, and M. Cramer, Phys. Rev. Lett. **94**, 060503 (2005)

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