

Abstract Submitted  
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**Improving the cooling performance of a mechanical resonator with two-level-system defects**<sup>1</sup> TIAN CHEN, XIANG-BIN WANG, Tsinghua University — We study cooling performance of a realistic mechanical resonator containing defects. The normal cooling method through an optomechanical system does not work efficiently due to those defects. We show by employing periodical  $\sigma_z$  pulses, we can eliminate the interaction between defects and their surrounded heat baths up to the first order of time. Compared with the cooling performance of no  $\sigma_z$  pulses case, much better cooling results are obtained. Moreover, this pulse sequence has an ability to improve the cooling performance of the resonator with different defects energy gaps and different defects damping rates.

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