

**INTRODUCTION OF MULTILAYERED GRAPHENE
FOR THE PRACTICAL APPLICATION OF NEAR-FIELD
THERMOPHOTOVOLTAIC SYSTEM WITH ENHANCED PERFORMANCE**

Mikyung Lim, Seung S. Lee, Bong Jae Lee

*KAIST Department of Mechanical Engineering,
291, Daehak-ro, Yuseong-gu, Daejeon 34141, South Korea

ABSTRACT. The present work aims to develop the near-field thermophotovoltaic energy conversion device with high performance by introducing multilayered graphene. Multilayered graphene shifts the surface plasmon polariton condition to the condition where surface plasmon polariton can have significant impact even for larger gap distance. It is found that three layers of graphene can increase the power output by 4.9 times at vacuum gap width of 50 nm whereas a monolayer of graphene has negligible effect at that vacuum gap. The results obtained in this study can lend a helping hand to the future development of practical thermophotovoltaic system with high performance.