

CIRCULARLY POLARIZED THERMAL RADIATION IN α -MoO₃/ β -Ga₂O₃ TWISTED LAYERS

Marco Centini^{1*}, Chiyu Yang², Maria Cristina Larciprete¹, Mauro Antezza^{3,4}, Zhuomin M. Zhang²

¹Sapienza University of Rome Department of Basic and Applied Sciences for Engineering,
Via A. Scarpa 14, I-00161 Rome, Italy

²George W. Woodruff School of Mechanical Engineering,
Georgia Institute of Technology, Atlanta, GA 30332, USA

³Laboratoire Charles Coulomb (L2C), UMR 5221 CNRS-Université de Montpellier,
F- 34095 Montpellier, France

⁴Institut Universitaire de France, 1 rue Descartes, F-75231 Paris Cedex 05, France

ABSTRACT. We numerically investigated the possibility to obtain circularly polarized infrared thermal emission from a bilayer scheme taking advantage of the strong anisotropy of low symmetry materials such as β -Ga₂O₃ and α -MoO₃. Our results show that it is possible to achieve a high degree of circular polarization over 0.85 at two typical emission frequencies related to the excitation of β -Ga₂O₃ optical phonons. Our simple but effective scheme could set the basis for a new class of lithography-free thermal sources for IR bio-sensing.

* Corresponding Author: marco.centini@uniroma1.it