

Laboratory search for light dark matter and dark energy candidates by high-intensity lasers

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Probing the nature of the quantum vacuum is indispensable to resolve the crucial problems in contemporary physics; dark matter and dark energy in the universe. Probing the vacuum to date has been limited to either the macroscopic space-time via astronomical observations or microscopic space-time points at high-energy particle collisions. With high-intensity lasers, however, we anticipate to be able to unveil the different aspects of the quantum vacuum at different space-time scales. We present the new approach to realize the laboratory search for low-mass and weakly coupling particles which can be light Dark Matter / Dark Energy candidates by utilizing four-wave mixing process in the vacuum with high-intensity lasers.

Biography

Kensuke Homma is currently the Assistant Professor in Hiroshima University and the visiting scientist at IZEST (International Center for Zetta-Exawatt Science and Technology) in Ecole Polytechnique after spending time during 2009-2011 in Ludwig-Maximilians-Universität München as the guest Professor. He has published ~250 papers mostly in particle and nuclear physics. Among them, several papers are relevant to fundamental physics accessible by high-intensity laser fields.

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