UNIVERSITAS INDONESIA
Veritas, Probitas, Iustitia
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

Department of Physics
Faculty of Mathematics and Natural Sciences
Universitas Indonesia

WEEKLY SEMINAR

FEW METHODS IN STUDYING NON-PERTURBATIVE PHENOMENA

Educational Background:

- PhD in Theoretical Physics, University of Leiden, Leiden, The Netherlands (2010)
- Diploma in High Energy Physics, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy (2006)
- Master of Science in Theoretical Physics, Bandung Institute of Technology, Bandung, Indonesia (2005)
- Bachelor of Science in Theoretical Physics, Bandung Institute of Technology, Bandung, Indonesia (2003)
- Bachelor of Engineering in Informatics, Telkom University, Bandung, Indonesia (2002)

Selected Publications:

- A. N. Atmaja, *Phys. Lett. B* **768**, 351 (2017)
- A. N. Atmaja and H. S. Ramadhan, *J. High Energy Phys.* **1602**, 117 (2016)
- A. N. Atmaja, H. A. Kassim, and N. Yusof, *Eur. Phys. J. C* **75(11)**, 565 (2015)
- A. N. Atmaja, H. A. Kassim, and N. Yusof, *Phys. Rev. D* **91(8)**, 086006 (2015)
- A. N. Atmaja and H. S. Ramadhan, *Phys. Rev. D* **90(10)**,105009 (2014)
- A. N. Atmaja, J. de Boer, and M. Shigemori, *Nucl. Phys. B* **880**, 23 (2014)
- A. N. Atmaja, *J. High Energy Phys.* **1304**, 021 (2013)
- A. N. Atmaja and K. Schalm, *J. High Energy Phys.* **1104**, 070 (2011)
- A. N. Atmaja and K. Schalm, *J. High Energy Phys.* **1008**, 124 (2010)

Abstract

Non-perturbative phenomena has a close connection with non-linear physics which is ubiquitous in everyday physics. It goes beyond perturbation expansion in which perturbation's calculation can not be trusted in order to capture the correct dynamics. There are several methods developed by physicist to tackle this problem. In this seminar, I will discuss two methods that have been my main research in the last 10 years. The first method is AdS/CFT, or in general Gauge/Gravity, correspondence which was derived from String Theory. I will discuss how this method could solve the problem for calculating observables in sQGP (strongly coupled Quark-Gluon Plasma), which may has been produced in the LHC experiments at CERN, and they are self-photon production rate and drag force. The second method is called BPS Lagrangian approach which I develop to obtain BPS equations in a model. The BPS equations are first-order differential equations of Solitons which are known to exist at non-perturbative regime. These BPS equations not only simplify the second-order differential equations of Euler-Lagrange equations, but are also closely related with supersymmetry which has been one of the main attentions in the LHC experiments at CERN. I will show how this method works for the case of three dimensional generalized Maxwell-Higgs model.

Dr. Ardian Nata Atmaja

Researcher
Research Center for Physics
Indonesian Institute of Sciences (LIPI)
Puspiptek, Serpong, South Tangerang 15314, Indonesia

13.00 – 15.00 WIB

Main Seminar Room
Dept. of Physics, FMIPA UI
Depok

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Wednesday

May 2018

This seminar is open to the public (students, lecturers, researchers, etc.) and free of charge