

# Unique limit cycle in Lienard's dynamical system driven by fast changing periodical force

Sergei Borisenok,<sup>1,2</sup> Nayyer Iqbal<sup>1</sup>

<sup>1</sup> Abdus Salam School of Mathematical Sciences,  
Government College University,  
35-C/2, Gulberg 3, Lahore, Pakistan  
sebori@mail.ru

<sup>2</sup> Dept. of Physics, Herzen State Pedagogical University  
48 Moika River, 191186 St. Petersburg, Russia

**Abstract.** We investigate a unique limit cycle in Lienard's dynamical system, driven by fast changing periodical external force. After the application of Kapitza's averaging procedure we formulate the conditions for its existence in the smooth coordinate system.

*Key words* : Lienard's theorem, open-loop control  
*MSC2000*: 37N35