The Lidov-Kozai oscillation and Hugo von Zeipel

Takashi Ito\textsuperscript{1} and Katsuhito Ohtsuka\textsuperscript{2}

\textsuperscript{1}Center for Computational Astrophysics, National Astronomical Observatory of Japan (tito.geoph.s@95.alumni.u-tokyo.ac.jp)
\textsuperscript{2}Tokyo Meteor Network at Ohtsuka Dental Clinic (ohtsuka@jb3.so-net.ne.jp)

It is widely accepted that the theoretical framework of the so-called Lidov-Kozai oscillation was established independently in the early 1960s by a Soviet Union dynamicist (Michail L'vovich Lidov) and by a Japanese celestial mechanist (Yoshihide Kozai). A large variety of studies has stemmed from the original works by Lidov and Kozai, now having the prefix of "Lidov-Kozai" or "Kozai-Lidov." However, from a survey of past literature published in late nineteenth to early twentieth century, we have confirmed that there already existed a pioneering work using a similar analysis of this subject established in that period. This was accomplished by a Swedish astronomer, Edvard Hugo von Zeipel. In this presentation we make a brief summary of von Zeipel's work on this subject in contrast to the works of Lidov and Kozai, and show that von Zeipel's achievements in the early twentieth century (written and published in French under the title "Sur l’application des séries de M. Lindstedt à l’étude du mouvement des comètes périodiques") already comprehended most of the fundamental and necessary formulations that the Lidov-Kozai oscillation requires. By comparing the works of Lidov, Kozai, and von Zeipel along this line of studies, we assert that the prefix "von Zeipel-Lidov-Kozai" should be used for designating this theoretical framework, and not just Lidov-Kozai or Kozai-Lidov.