Contribution ID: **1069** Type: **Oral**

Manifestation of Devil's staircase and Negative Differential Resistance in the IV- Characteristics of φ0 Josephson Junction

Wednesday, 26 October 2022 15:00 (15 minutes)

The anomalous Josephson structures with coupled superconducting and magnetic characteristics allows the manipulation of magnetic properties by Josephson current [1]. In junctions with a strong spin-orbit coupling (φ0 Josephson junction), we demonstrate an appearance of additional fractional subharmonic steps in the IV-characteristics under external electromagnetic radiation due to spin-orbit coupling. An origin of subharmonic steps is related to the locking of magnetic moment precession to the Josephson oscillations. We prove that the positions of those steps follow a continued fraction algorithm. In addition to this, we demonstrate the appearance of negative differential resistance on the IV-characteristic, resulting in an additional locking step of magnetic precession [2]. We show that it is possible to control not only the frequency but also the amplitude of the magnetic precession in the locking region.

Primary authors: Dr NASHAAT, M. (BLTP); Prof. SHUKRINOV, Yu. M. (BLTP); Dr KULIKOV, K. V. (BLTP); Ms ABDELMONEIM, , S. A. (Menoufia University)

Presenter: Dr NASHAAT, M. (BLTP)

Session Classification: Theoretical Physics

Track Classification: Theoretical Physics