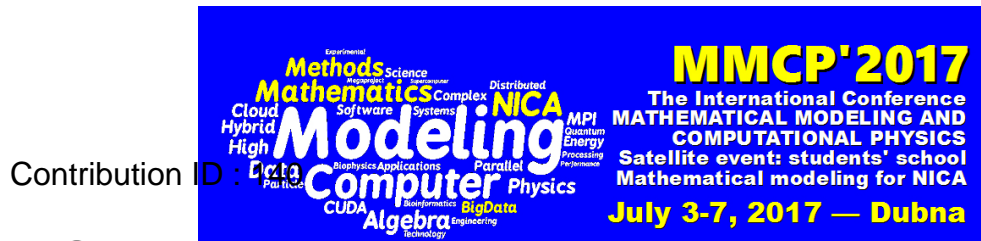


# International Conference “Mathematical Modeling and Computational Physics, 2017” (MMCP2017)



## Simulation of collective excitations in the stack of long Josephson junctions

Thursday 06 Jul 2017 at 17:00 (00h15')

### Content :

We consider the generalized model of the system of coupled long JJs[1] which takes into account the inductive and capacitive coupling and the diffusion current[2,3]. Numerical investigation of phase dynamics of long JJs stack is based on the parallel simulation algorithm which provides an essential acceleration of simulation procedure[4]. Using the developed numerical approach, we demonstrate a creation of charge travelling wave in the system of coupled LJJs. Another important result is related to the demonstration of the coexistence of the charge travelling wave with the standard fluxon mode. This fact indicates an appearance of a new unique collective excitation in the system of coupled Josephson junctions, namely, a composite state of the Josephson current, electric field, and vortex magnetic field. We have demonstrated the effect of this collective excitation on the power of the electromagnetic radiation from the stack of long JJs.

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[4] I. R. Rahmonov, Yu. M. Shukrinov, A. Plecenik, E. V. Zemlyanaya and M. V. Bashashin, EPJ Web of Conferences V108, 02038 (2016).

**Primary authors** : Dr. RAHMONOV, Ilhom (BLTP, Joint Institute for Nuclear Research)

**Co-authors** : Prof. SHUKRINOV, Yury (BLTP, Joint Institute for Nuclear Research) ; Dr. ATANASOVA, Pavlina (Plovdiv University, Bulgaria) ; Dr. ZEMLYANAYA, Elena (leading researcher) ; Dr. STRELTSOVA, Oksana (JINR) ; Mr. ZUEV, Maxim (JINR) ; Mr. BASHASHIN, Maksim (Laboratory of Information Technologies, JINR)

**Presenter** : Dr. RAHMONOV, Ilhom (BLTP, Joint Institute for Nuclear Research)

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