

## **PT SYMMETRIC BREAKING AND PHOTONIC TRANSMISSION IN OPTICAL SYSTEMS**

Durajski A.P.<sup>1</sup>, Jarosik M.W.<sup>1</sup>, Szczesniak R.<sup>1</sup>, Leonski W.<sup>2</sup>

<sup>1</sup>*Institute of Physics, Czestochowa University of Technology, Czestochowa, Poland*

<sup>2</sup>*Quantum Optics and Engineering Division, Faculty of Physics and Astronomy, University of Zielona Gora, Zielona Gora, Poland*

If Hamiltonian has the unbroken PT symmetry, then the energy spectrum is real and the evolution is unitary. Currently in the literature the PT symmetry are illustrated by using many quantum-field models. In the presented work, we have study the PT symmetric phase transition in optical systems by investigating the spontaneous symmetric breaking. The case of balanced loss and gain has been considered. We have discussed in detail the non-periodical dynamics of photonic transmission in the PT symmetry broken phase.