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Szkoła IN :□ Friday 16 of October 2015, g. 10:00-12:00, room 0.06, Pasteura 5, Faculty of Physics University of Warsaw

The use of polariton condensates in all optical logic devices has been the subject of intense research in recent years, promising ultrafast switching times, low losses, spin information transport and low power consumption.

In this talk I report on the realization of a novel switches and a logic AND gate mediated by propagating Bose-Einstein exciton-polariton condensate bullets in a quasi-1D semiconductor microcavity. I will also show how spin-selective spatial filtering of these propagating condensates can be achieved using a controllable spin-dependent gating barrier: a non-resonant laser beam provides the source of propagating polaritons, while a second circularly polarized weak beam imprints a spin dependent potential barrier, which gates the polariton flow and generates polariton spin currents. A complete spin-based control over the blocked and transmitted polaritons is obtained by varying the gate polarization.

The experimental results are interpreted in the light of simulations based on a generalized Gross-Pitaevskii equation.

Szkoła odbywa się dzięki wsparciu projektu POKL UDA – POKL.04.01.01-00-100/10 "Chemia, fizyka i biologia na potrzeby społeczeństwa XXI wieku: nowe makrokierunki studiów I, II i III stopnia" prowadzonemu na Wydziale Chemii UW.