

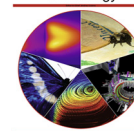


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Full length article

## Influence of mode coupling on three, four and five spatially multiplexed channels in multimode step-index plastic optical fibers



Svetislav Savović<sup>a,b</sup>, Alexandar Djordjevich<sup>b,\*</sup>, Ana Simović<sup>a</sup>, Branko Drljača<sup>c</sup>

<sup>a</sup>University of Kragujevac, Faculty of Science, Kragujevac, Serbia

<sup>b</sup>City University of Hong Kong, Department of Mechanical and Biomedical Engineering, Kowloon, Hong Kong, China

<sup>c</sup>University of Priština, Faculty of Science, L. Ribara 29, Kosovska Mitrovica, Serbia

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### ABSTRACT

We investigate the influence of mode coupling on space division multiplexing capability of three multimode step-index plastic optical fibers with different strengths of mode coupling. Results show that mode coupling significantly limits the fiber length at which the space division multiplexing can be realized with a minimal crosstalk between the neighbor optical channels. Three, four and five spatially multiplexed channels in the investigated multimode step-index plastic optical fibers can be employed with a minimal crosstalk up to the fiber lengths which are about 7%, 5% and 3% of the corresponding coupling lengths (fiber length where equilibrium mode distribution is achieved), respectively. Such characterization of optical fibers should be considered in designing an optical fiber transmission system for space division multiplexing.

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\* Corresponding author at: City University of Hong Kong, Department of Mechanical and Biomedical Engineering, Kowloon, Hong Kong, China.

E-mail address: [mealex@cityu.edu.hk](mailto:mealex@cityu.edu.hk) (A. Djordjevich).