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## A new method improving multiplication factor in micro-pixel avalanche photodiodes with high pixel density

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Results of simulation based on a new iterative model of avalanche process in micropixel avalanche photodiodes with low pixel capacitance (or high pixel density) are presented. The new model describes development of the avalanche process in time, taking into account change of electric field within the depleted region and the effect of parasitic capacitance shunting individual quenching micro-resistors on device parameters. Simulations show that the effective capacitance of a single pixel, which defines the multiplication factor, is the sum of the pixel thermal capacitance and a parasitic capacitance shunting its quenching micro-resistor. Conclusions obtained as a result of modelling are compared with experimental data, which demonstrate possibilities of increasing the pixel gain in micropixel avalanche photodiodes with low pixel capacitance.

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