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Size optimization of a quad-cell alignment detector for short range free space optical interconnects

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Abstract: In this paper we consider geometry optimization of a quad-cell alignment detector for short range free space optical interconnects. The alignment technique uses alignment beams and quad detectors to detect different misalignment errors. We show that the size of the quad detector cells can be used as a design parameter to optimize the sensitivity of the alignment system. The sensitivity analysis and error signal generation are presented assuming standard Gaussian beam models. Results on optimum sensitivity for the case of transverse and angular misalignments are presented and discussed