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Author: Dr. Andreas Eckardt
DLR, German Aerospace Center, Germany, andreas.eckardt@dlr.de

Prof. Ralf Reulke
DLR German Aerospace Center, Germany, ralf.reulke@dlr.de
Mr. Stefan Hilbert
DLR German Aerospace Center, Germany, stefan.hilbert@dlr.de
Dr. David Krutz
DLR German Aerospace Center, Germany, david.krutz@dlr.de

CMOS-TDI PERFORMANCES BY MODIFICATION OF CONTROL SIGNALS

Abstract

The Institute of Optical Sensor Systems (OS), part of the Robotics and Mechatronics Center of the German Aerospace Center (DLR) has more than 30 years of experience with high-resolution imaging technology. This paper shows the institute's scientific results of the CMOS detector design in a TDI (Time Delay and Integration) architecture. These technological design results open the door for the next higher detector design integrations. DLR OS and the Fraunhofer Institute for Microelectronic Circuits and Systems in Duisburg were driving the technology of new detectors and the FPA design for future projects, new manufacturing accuracy and on-chip processing capability in order to keep pace with the ambitious scientific and user requirements. In combination with the engineering research, the current generation of space borne sensor systems is focussing on VIS/NIR high spectral resolution to meet the requirements on earth and planetary observation systems. DLR OS was investigating research to shape the internal control signals of the CMOS TDI detector to optimize the performances. This work is essential to understand the requested technology for complex TDI detector design. The paper gives an overview over the detector DLR evaluation FPA equipment, new control possibilities for CMOS-TDI detectors in synchronisation control mode, and key parameters like noise, dark noise, cross talk, spectral response, quantum efficiency will be discussed in detail.