

## Chronopixel Project Status

A monolithic CMOS pixel detector with time stamping capability (Chronopixel) is being developed, in collaboration with the Sarnoff Corporation (which was recently renamed into SRI International). The design goals are based on the requirements of an ILC vertex detector. The main feature of the design is that each hit is accompanied by a time tag with sufficient precision to assign it to a particular bunch crossing of the ILC (thus the name Chronopixel). This reduces the occupancy to negligible levels, even in the innermost vertex detector layer, yielding a robust vertex detector which operates at the background levels significantly in excess of those currently foreseen for the ILC. Chronopixel differs from the similar detectors developed by other groups by the fact, that it is monolithic and is using standard CMOS process. The first set of prototype devices was fabricated in 2008, and tests results were reported in 2010. The second prototype was fabricated in 2012 with test results reported in 2013. The third prototype was fabricated in 2014. Main goal of the third prototype was the test of possible solutions for the problem, discovered in prototype 2. The problem was traced to the TSMC design rules for 90 nm technology, and led to unacceptable large value of the sensor diode capacitance. Six different layouts for the sensor diode were tested in prototype 3, and tests have shown that high capacitance problem was solved.

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