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【316】 Results from low temperature wafer-wafer bonded pad-diodes for particle detection

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Low-temperature covalent wafer-wafer bonding enables the creation of novel types of semiconductor particle detectors, including the monolithic integration of high-Z materials with conventional CMOS sensors. To investigate the influence of the bonding interface on the signal formation within such structures simple bonded pad diodes have been fabricated. We present results from two different fabrication runs. Initial results showed that these types of structures are very sensitive to trace contaminations which can distort their depletion behaviour. But we show that even under non-ideal bonding conditions, the resulting signals can be fully predicted from first principles based on the extended Shockley-Ramo theorem.

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