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# Radiation hard active pixel sensor with 25µm x 50µm pixel size designed for capacitive readout with RD53 ASIC

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We will present a sensor chip for a capacitively coupled particle detector (CCPD). CCPDs have been proposed for several experiments and it has been demonstrated that the signals from the sensor to the readout chip can be transmitted when the chips are glued. However, it is still not proven whether gluing can be done fast on a large number of devices. Therefore, we are investigating a new concept. The readout chip and the sensor chip are mechanically connected with a small number of large bump bonds. The signals from pixels are still transmitted capacitively. No glue is used. The benefit of this concept is that a conventional flip chip technique can be used to build the detector. Since the bumps can be large, an industrial bumping process can be used which assures low cost. The sensor chip is based on HVCMOS structure. A special design is used to ensure large output signals that are needed because the gap between the sensor and the readout chip is large. The pixel size is 25µm x 50µm and the transmitting electrode pitch is 50µm x 50µm. Therefore for the readout of the sensor, a standard HL-LHC readout chip developed by RD53 collaboration can be used. The CCPD sensor chip has been produced. Measurement results and design details will be presented in this contribution.

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