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Hybridization of the Planar Pixel Modules for ATLAS ITK upgrade

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In the development of pixel detectors for the HL-LHC ATLAS Inner Tracking Detector upgrade (ITk), thin and finer granularity pitch planar pixel detector has been developed by HPK/KEK and is ready for the production. The hybridization optimization was started using the FE-I4 ASIC (250um x 50um pitch) for the current ATLAS pixel detector. Recently a half size but final pitch readout ASIC, RD53A (50um x 50um pitch), which is supposed to be the last prototype before the pre-production chip, became available and the modules with this ASICs have been tested in testbeam before and after irradiation.

In this presentation, I will summarize the progress in the HPK/KEK hybridization development using sensor UBM and Sn/Ag solder bumps and related sensor development targeting to implement on-pixel biasing structures. The sensor module production plan is also covered.

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