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Strip Printed Circuit Board - PCB validation and properties for CMS iRPC during Phase 2 Upgrade

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Designed using thin low resistivity High Pressure Laminate gaps, the improved RPC (iRPC) chambers are proposed to equip the very forward region of the CMS detector, since they can stand rates of few kHz/cm^2 . A dedicated three layers Printed Circuit Board (PCB), carrying 48 strips each, has been designed to collect the pick-up signal from both ends of each strip. It transmits the signal to the Front End Board (FEB) via internal return lines connected to an ERNI connector. Its large trapezoidal size (1m long and 30-60 cm large) for a total thickness of 600 micrometers, makes this device quite exceptional. A dedicated R&D is carried out to maximise the output signal strength: maximise the pickup charge, minimize the transition losses, keep a constant impedance inside the PCB to minimize the reflections and match this impedance to the one of the FEB. Results from the first prototypes will be presented: performance, impedance, speed of signal, pick-up charge attenuation and total attenuation during transit.

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Session Classification: Poster session