ID contributo: **187** Tipo: **Poster**

Studies of the CBC3.1 readout ASIC for CMS 2S-modules

venerdì 27 maggio 2022 15:53 (1 minuto)

The CBC3.1 is the nal version of the readout ASIC for 2S-modules in the outer radial region of the upgraded CMS Tracker at the High Luminosity LHC. The chip development was completed in an engineering run in 2018. Subsequently two pre-production lots of wafers were delivered in 2019, and large scale production deliveries began in May 2021. So far almost 270 production wafers have been received. The engineering run wafers and pre-production lots were tested using an automatic wafer prober, intended for nal acceptance tests, and showed some variations in yield of good chips across the wafers, whose patterns suggested non-optimal processing in the foundry. To try to understand this better, the probe station was adapted so that measurements could be carried out at low temperatures, down to 30C.
Although both preproduction and production wafers have a high yield of good chips, some unexpected behaviour was observed at low temperature. Rare memory errors were observed when the hit data are read out. The wafers aected are from lots with patterns of central yield loss, and the errors do not seem to be present in better quality wafers. However, the rate of occurrence is so low that there should be negligible impact on CMS track reconstruction.
The second issue is occasional corruption of some registers which store ne tuning values for individual channel pedestals, following certain write operations into specic registers. This also appears to be correlated with manufacturing quality and although the impact should be minor, and probably avoidable during tracker operation, the origin of the problem is not yet fully understood and is the subject of ongoing investigations.
The status of the wafer probing will be presented with results from studies to date.

Collaboration

CMS collaboration

Relatore: HALL, Geoff (Imperial College London)

Classifica Sessioni: Front End, Trigger, DAQ and Data Mangement - Poster session